

UNIVERSITY OF TAMPERE

**MASTER'S THESIS IN PUBLIC POLICY
AND FINANCIAL MANAGEMENT**

**Tax incentive Policies and Private sector's Investments for
R&D and Innovations in Vietnam**

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Abbreviations

BERD	Business expenditure for R&D
CIEM	Central Institute for Economic Management
FDI	Foreign Direct Investment
GDP	Gross Domestic Productivity
GERD	Gross Domestic Expenditure on R&D
IPR	Intellectual Property Rights
MOF	Ministry of Finance
MOPI	Ministry of Planning and Investment
MOST	Ministry of Science and Technology
OECD	Organization for Economic cooperation and development
R&D	Research and Development
R&D&I	Research and Development and Innovation
SMEs	Small and medium-sized enterprises
SOEs	State-owned enterprises
STI	Science, Technology and Innovation
STDF	Science, Technology development Fund
S&T	Science and Technology
TFP	Total Factor Productivity

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Abstract

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Research and development activities are very specific in their natures and then need to be encouraged and to get highest supports in incentive tax measures.

Incentive tax measures actually applied in Vietnam. This thesis gives contributions to clarify and evaluate the status, limited aspects of these tax incentives for R&D activities through a qualitative case study.

Results indicate that tax incentive policies remain limited in many aspects, show some shortcomings and inconsistencies among relating regulations, and are stamped on a small number of enterprises such as FDI, state-own ones.

Findings provide some suggestion for policymakers, managers for further consideration to support R&D activities in enterprises in the coming time.

CHAPTER 1

Introduction and the significance of the research topic

1. Introduction

Innovation is an essential driver of long-term development of an economy. Innovation will also play a role in helping to find solutions for many global challenges from climate change to ageing populations. Empirical evidences indicate that innovation, which knowledge is applied to form the better or more effective products, processes, services and systems, are a key condition not only for business competitions but also the rapid growth of the economy.

Over the last decades launched political and economic reforms, Vietnam has moved from a low-income economy based on agriculture to an industrializing economy with lower middle income. When the previous engine of growth are decreasing in power, raising the threat of a “middle-income trap”, Vietnam strategy pays attention to structure reform and environmental sustainability. The country’s new growth model will focus on building on human capabilities, free trades, and especially research and development and innovations. Research and development and innovation will be the key drivers of Vietnam’s economic growth.

Although Vietnam has decided to make of research and development and innovations one of its top priorities its research and development (R&D) expenditures is lagged behind. By setting the concrete targets, Vietnam aims at revising this situation. It has set the goal to reach an R&D intensity of 2% of GDP by 2020, of which the target of fostering business- financed R&D to a proportion of 2/3 of all R&D expenditures. However, the gap between the current R&D expenditures and its goal is widening, and Vietnam’s business sector accounts for a very small share of R&D expenditure. Thus, Vietnam faces tremendous difficulties in adopting new technologies. The country’s innovation system is weak and contributes little to output or growth. Still missing is a critical mass of dynamic and creative firms that are the main agents for innovation. In addition, the infrastructures for research and developments remain underdeveloped. Companies struggle to acquire the knowledge and facilities to undertake new research that can bring on to the market. The Technology and Competitiveness surveys, the main Vietnam’s national statistics, in 2011 and 2013 illustrate that the number of firms carrying out in-house technology innovations remains very rare. Although not all firms that innovate carry out R&D, investment in R&D plays a major role in facilitating technology-based innovations that bring new and significantly improved products, services and processes to the market. In the recent report “Vietnam: Enhancing enterprise competitiveness and SME linkages” of the World Bank and Ministry of Industry and Trade (2017,

p.29) found that: (i) Vietnamese firms seek to improve their products and processes no less than their peers in other countries in the region, but that they more rarely introduce new products or new functions to their market; (ii) Spending on R&D is lower than in most Southeast Asian countries and few firms invest in licensed or patented knowledge to support their innovation efforts.

R&D that leads ultimately to innovation is a challenging process with risks. Direct financial support and fiscal incentives are two main types of policies that can be used by governments to stimulate business R&D. Tax incentives, an indirect means of supporting R&D, acts as popular policy instrument to boost R&D activities of businesses through reduced a firm's tax burden or increased the R&D expenditure. The costs of private R&D are lowered by tax incentives after R&D activity has been performed. R&D tax incentives are neutral in terms of content of R&D being supported, and they reach out to all kind of firms. This sustainable instrument provides for enterprises a reliable foundation of financial planning and R&D decisions in long-term strategy (Kohler et al., 2012, p.1-2).

Tax incentives policies remain the main elements in the Vietnamese government response to private sector's R&D and innovations. A tax exemption or reduced tax rate incentive is available for companies with income from performing R&D, the sale of products during tests production, and products made from new technology. Vietnamese laws are allowed firms to invest a maximum of 10% of their pre- tax profit that they would gain significant tax relief to form their science and technology development fund (Article 17, Law on Corporate Income Tax). This form of the incentive can be seen as similar as a tax deferral, which is a delay in the payment of taxes. However, many of the existing policies remain inadequate and irrelevant to encourage further investments.

R&D tax incentives have been widely applied by government over the past 40 years, and a huge number of studies analyzed their impact. Thus, understanding the effectiveness of this policy instrument is very important in times when governments seek for alternatives to balance budgets and find new sources of growth. This study focuses on one specific R&D tax incentive scheme in Vietnam and its design features under consideration in order to allow conclusions on the effectiveness of policy design. Based on motivation for the managerial need, this study focuses mainly on fiscal incentives to business R&D and aim to facilitate this task and motivate better policy by:

- Evaluating the relevance, efficiency, effectiveness, impact and sustainability of R&D tax incentives, especially focusing on the actually valid regulations for corporate income taxes applied to R&D activities.
- Providing an overall picture of existing R&D tax incentives and identifying good practices.

- Recommending the Vietnamese R&D tax incentives policy.

2. Research aims and objectives

Many policies of countries, both developed and developing, have been issued with a view to supporting for business R&D. These policies are often delivered, whether in the form of direct or indirect support, via various fiscal instruments. The general aims of this paper are to reflect actual performance of specific tax incentive policies for business R&D in Vietnam, and base on analyzing the international practices of tax incentives in innovation activities that finds the key recommendations for Vietnam.

The objectives of the study is to provide evidence of the performance of the current status of Vietnamese tax incentive policies for business R&D, especially focusing on the limitations and difficulties for practical application of gaining corporate income tax-exempted for R&D activities. In addition, through identifying the core factors for creating favorable environment of existing R&D tax incentives and identifying good practices in the world that boosts the firm's investment flow for R&D and innovation that are the fountain of knowledge and provide guidelines for solving problems in Vietnam.

3. Research problems

Government encourage business R&D because it is not necessary due to any imbalance between private and social interests in specific industries, but the role of business R&D as a key driver of future knowledge and innovation based economic growth. For the case of tax incentives in R&D, tax incentives are mainly used to encourage enterprises to increase their investment in R&D.

Compared to the actual tax incentive policy for R&D of business of some countries around the world, tax policy of Vietnam has almost no encouraging effect on business R&D. There are still many limitations and shortcomings in taxation legal documents in Vietnam in relation to support for business R&D, no through consideration of R&D specific characteristics, inconsistency in many legal taxation documents, difficult enforcement in practice and so on and so forth. Hence, there are been some emerging problems that need to be solved in the earliest time.

The research problem can be summarized into the following questions:

What is the current of Vietnamese tax incentives policies? How does it work? What are the limitations and difficulties for practical application of gaining corporate income tax-exempted for R&D activities? What are the inadequate and irrelevant regulations for these issues? Why?

This study conducts for R&D businesses in Hanoi and Ho Chi Minh City. For the limitations of the study, the greatest challenge in conducting the study could be collected data from companies that have invested R&D activities and gained corporate income tax-exempted for these

activities. In addition, no previous similar researches about this topic have been conducted and no available data in Vietnam thus the study is carried out by my experience and understanding.

4. Structure of the research

There are seven chapters in the research. The first chapter pays attention to the introduction of research topic. In this chapter, it consists of the background information and significance of the topic, research aim and research problem. Second chapter relates to the review of literature of the thesis. This chapter mentions to the evaluation theory, the rationale of state support for business R&D, design features of tax incentives policy for business R&D and the impact of fiscal incentives towards R&D business. Third chapter is about research methodology. Research instrument focuses on evaluation criteria and method. Fourth chapter pays attentions to the overview of tax incentives for R&D activities by enterprises as stipulated in legal documents of Vietnam. Fifth chapter is the result of evaluating tax incentives policies in Vietnam in terms of relevance, effectiveness, efficiency, impact and sustainability. Chapter 6 provides a brief overview of the way to find the performance of tax incentives policies for business R&D in Vietnam through the desk study, the stakeholder workshops, the questionnaire survey and subsequent analysis. In the last chapter, conclusion and recommendations are shown on concretely to illustrate the aims of the thesis.

Chapter 2

Theoretical foundation of fiscal measures towards R&D

1. Evaluation theory

As defined by American Evaluation Association, evaluation involves assessing the strengths and weaknesses of programs, policies, personnel, products, and organizations to improve their effectiveness. Of the various definitions for evaluation, evaluation refers to the process of identification, clarification, and application of defensible criteria that determine an evaluation object's value (worth or merit), quality, utility, effectiveness, or significance in relation to those criteria (Worthen et al., 1997, p.5).

According to Shaw et al., (2006), the evaluation of public policies, program, and practices seem to be an intrinsic part of democratic government for four reasons. Information about government performance that the public needs to know is reported through evaluation process. It brings new data to the existing knowledge required for government action. It also supports an analytical capability within agencies that moves them away from territoriality and toward a culture of learning. Their spirits of skepticism and willingness embrace dissent that help keep the

government honest. Evaluation thus serves a lot of purposes, and it is popular to find that what may have begun, say, as an accountability study of government performance, and up dominated by a different purpose or at least includes other purposes as an integral part of the evaluation.

2. Nature of state support for R&D of business

Governments can encourage R&D in many different ways, but there are two most prominent policies normally used by countries, such as: direct incentive policy measures such as providing subsidies, loans, grants; and indirect policy measures such as tax incentives (tax deduction or tax credit). Hereunder are some justifications for the need of public support for business R&D.

First, the imperfection of system

Innovation is not a linear process from science to market; it is a complex system composing of many different elements. Innovation system is a consortium of integrated organizations with different functions from production, information and special knowledge accumulation required in the innovation process (Lundvall., 2004). As the system is formed from various elements and interactions between the elements always exist, defects in the system are unavoidable. A system defect can occur at any time when the access to necessary knowledge is prevented, or the knowledge producing organization or the accessing agency to such knowledge fails, or the link of information between corresponding organizations is lost or ineffective (Gustafsson et al., 2006). Thus, it makes innovation policy become an issue in the design of an appropriate institutional set up, or social capacity building plan in order to materialize the potential for development. Clearly, business is the key (direct or indirect) player by their dual role as technology users and technology providers in the innovation process, in association with universities, R&D institutes, laboratories, social organizations and consulting firms. In really, in any knowledge-based economy, there exists a network of organizations as stakeholders in the innovation process.

Second, the imperfection of market

Many scholars believe that in the creation and dissemination, diffusion of knowledge there appears a series of visual market defects which may be weaken the incentive measures in R&D investment and introduction of innovation.

From the investment view, investments for innovation have several features that make them different from traditional investment. Neoclassical theory suggests about the characteristic of R&D activities. R&D is a challenging and risky process. Even if the business sector finances and performs most of the R&D, it will still perform less than what is optimal for the following reasons. These reasons are that the rationale for public financing initiatives can be taken.

R&D and innovation are characterized by externalities to the whole society (Nelson., 1959;

Arrow., 1962; Griliches., 1992; Lerner., 2002). Knowledge as a “public good” can be utilized free of charge, irrespective of original investors due to the properties of its non-exclusivity, resulting in underinvestment in innovation. This results in the fact that a company that performs R&D does not capture all the benefits of this process. It will therefore invest an amount of R&D that is below the socially optimal level (Leech., et al., 2012). The principal economic rationale for business R&D tax incentives, as for any government support of private R&D, is the presence of knowledge spillovers.

From studies on innovation and innovation policy, a number causes of market defect in the formation and use of knowledge has been reflected, as follows: (i) the uncertainty and risks related to R&D; (ii) the failure in implementation of innovation and use of new knowledge; (iii) misleading information in the economy; (iv) the failure to materialize the value of knowledge for economic growth; (v) underestimated assessment of technological goods strategy of enterprises.

Two main reasons can be clearly observed through the behavior of business towards research and development. The first may be due to limited resources owned by or low interest of small and medium enterprises in R&D compared to large enterprises. The second, it's due to perception of enterprises about the public property nature of knowledge. Businesses think that knowledge is public goods that can “disclose” to every business, so they do not need to make investment, as a result, investment in R&D and innovation falls under the necessary “threshold”. In addition, the third reason should be mentioned that there is asymmetric information about the expect outcome of R&D investments and sunk costs in R&D investment between investors and inventors (Hyytinen and Tovaine., 2005; Czarnitzki., 2006). This is quite understandable because efficient market transactions depend on the ownership of the transactions' property. The fourth reason is the uncertainty of benefits and publication of new knowledge of business. When competing on a new technology, businesses often have their strategy to prevent the dissemination of knowledge that has given them an advantage over the others. The last reason is the cause relating to social perspective or outlooks and the benefits resulting from certain goods and services still unrecognized for further development or only are the signals form markets (Gustafsson et al., 2006).

According to OECD (2015e), most governments often support for business R&D to be provided to firms with the target of correcting market failure, including: (i) difficulties by firms to fully appropriate the returns to their investment; (ii) challenges in seeking for finance from external sources, in particular for small or young firms.

To solve the problem of market imperfection, national governments can take various policy measures to promote knowledge based production, enhance economic benefits and social welfare such as: formation of an appropriate intellectual property system to protect knowledge creators,

strengthen humanity intellectual treasure; support investment making in R&D through direct grants or indirect financial instruments; forming special type of R&D organizations to enhance the access to new knowledge for enterprises; support universities and R&D institutes to discover new scientific knowledge. In addition, some countries, for example Ireland, Belgium and Israel, use support measures to attract the R&D activities, investment and jobs for foreign companies (OECD, 2015e).

Third, innovation and economic growth

One issue being accepted in economics theory and proved by empirical studies is the important role of business R&D for economic growth (Carvalho., 2011). Simply speaking, the economic growth of a country is most correlated with the country's investments into R&D, particularly business R&D; business R&D is the main driver of innovation, and innovation is the key driver of competitiveness and development of an economy.

The focus of policy varies among industries; it shows the evidence of market imperfection in R&D in general and in R&D performed by business, in particular, with different implications in terms of objectives, results and effectiveness of policies. Governments encourage private R&D because it is not necessary due to any imbalance between private and social interests in specific industries, but the role of business R&D as a key driver of future knowledge and innovation based economic growth. Fairly speaking, those policies addressing market imperfection issues or having a lot of innovations and for economic growth, they will enjoy benefits from the public support.

For the case of tax incentives in R&D, "non-discrimination" and enabling environment provided for the enterprises with "maximum autonomy" in the selection of research activity, large risky activities (OECD., 2008; Carvalho., 2011). Tax incentives are mainly used to encourage enterprises to increase their investment in R&D. It would say that tax incentives, among other indirect measures, have been the policy instrument of highest attention applied in R&D to encourage enterprises to conduct R&D.

3. Financial support policies for business R&D

According to OECD (2001), government support for business R&D seeks to encourage firms to invest in knowledge and in innovations that lead to benefits to society with the intention of correcting market failure in which are assumed to prevent the Pareto efficient allocation of R&D resources.

This support can be considered as one of the most important policies affecting business R&D. Concerning the different kinds of public intervention; government can support R&D business by two types, namely direct support and indirect support.

There are two categories of direct governmental support instruments to business R&D, such as: (i) fiscal incentives through a relief of the corporate tax pressure; and (ii) financial support.

Table 1. Heterogeneity in fiscal incentives for innovation

Sources of heterogeneity in the market (potential eligibility for incentives):
<ul style="list-style-type: none"> Types of innovation: R&D (basic research, applied research, experimental development), non R&D activities (e.g. acquisition of other external knowledge, acquisition of machine, equipment and other capital goods, training).
<ul style="list-style-type: none"> Types of R&D expenses: in-house R&D; procurement of R&D services; acquisition of rights to use IP (R&D assets).
<ul style="list-style-type: none"> Types of R&D business models: internally developed combined with commercialization; develop and sell; acquire R&D and commercialize.
<ul style="list-style-type: none"> Types of firms: start-ups, incumbents, small and medium-sized enterprises; multinational enterprises.
<ul style="list-style-type: none"> Types of financing: equity, debt, founder, angel investor, and venture capital, private vs. public.
<ul style="list-style-type: none"> Other economic and policy conditions in a country: bankruptcy laws, patent protection, STEM education, and immigration laws.
Sources of heterogeneity in fiscal incentives:
<ul style="list-style-type: none"> Types of fiscal incentives: grants, loans, guaranteed, tax.
<ul style="list-style-type: none"> Types of tax incentives: general/targeted; input/output; volume-based/incremental, temporary/permanent.
<ul style="list-style-type: none"> Targeted (complex, more subject to gaming) vs. general (more likely to create windfalls).
<ul style="list-style-type: none"> Type of tax: corporate income, personal income (including stock options), payroll, value added, and property taxes.

Source: OECD (2015b).

3.1. Direct financial support

Direct financial support (instance: grants, loans, and subsidies) given to selected companies helps address important public missions, such as defense, health care or energy development, or areas where significant gaps and private returns to R&D (Guellec, et al., 1999).

In analyzing those direct support mechanisms some negative issues deserve attention, such as: allocated distortion more subsidies than fiscal incentives. Hence it is essential to evaluate the net effect of those policies in order to verify whether the potential negative effects of these policies are

made up by their stimulating impacts.

On other hand, direct measure to business R&D has a positive effect on appearing to be stimulating the net amount of business R&D, particularly in improving the capacity of firms to digest the knowledge generated through public research. But this effect is only perceived up to a certain threshold of government R&D financing. Direct financing of industry R&D leaves governments open to dilemma of choosing winners and losers. Government financing can displace private R&D investments and distort market competition (Guellec and van Pottelsberghe., 1999).

3.2. Fiscal incentives

Fiscal incentives include all schemes that promote business R&D without an aim to a particular scientific or technological theme or sector. Tax incentives is a policy received high attention among indirect support policies to encourage enterprises to conduct R&D. Tax incentives have become a popular policy measure to foster R&D activities of enterprises.

Tax incentives target a decline to a firm's tax burden depending on the magnitude, or an increase to a firm's R&D expenditure. Tax incentives are considered attractive market-based mechanisms to reallocate the available resources for development of technology, and to estimate available public support ahead of undertaking an investment in industrial sectors and individual firms. (OECD, 2016, p.7)

Tax incentives for business R&D vary in countries around the world under different forms:

- ✓ Tax deduction (tax allowances): at a rate greater than 100% for the costs involved in R&D. It allows businesses to make more investment in R&D as this funding is deducted from taxable income of enterprises depending on their actual expenditure for R&D.
- ✓ Tax credits: a percentage of costs for R&D specially cut from the corporate income tax that businesses would have had to pay. This type of R&D tax incentive has become the most widespread.
- ✓ Accelerated depreciation schemes for investments (machinery, equipment, building intangibles) used for R&D activities.
- ✓ Special exemptions of wage and/or social taxes for workforces in R&D activities.

Fiscal incentives to R&D have a different set of advantages and disadvantages. These instruments generally provide a tax credit or allowance for certain portion of business R&D expenditures. By decreasing the cost of R&D, fiscal relief raises the net present value of prospective research projects. Tax incentives are also believed to give rise to lower problems of moral hazard compared to direct subsidies. Tax relief can be critical for motivating research in small and medium-sized enterprises as well as larger companies.

There are quite a few of differences between fiscal measures and direct financial support to

R&D. First, fiscal incentives are more neutral than direct R&D grants with regards to the beneficiary companies and regarding the allocation of the R&D expenditure itself. Second, the administrative cost of undertaking a fiscal incentive program can be lower than a financial one. Third, fiscal incentive schemes are more reachable than direct government support. Fourth, fiscal incentives can be more foreseeable from a corporate perspective than direct grants. Hall (1993) showed on this subject that the impact of the US tax incentive increased when the policy became stable.

Concerning about the reasons why the impact of financial considerations on the investment decision, these may be different in the type of investment and in the source of funds. One of the implications of the well-known Modigliani-Miller theorem (1958;1961) is that a firm choosing the optimal levels of investment should be indifferent to its capital structure, and should face the same price for all types of investment (including investments in creating new products and processes) on the margin.

In the matter of innovation investment, economic theory advances an excess of reasons why there might be a gap between the external and internal costs capital; these can be divided into three main types: (i) asymmetric information; (ii) moral hazard; and (iii) tax considerations that drive a segment between external finance and finance by retained earnings.

Thus, the conclusions from the empirical work are: first, the debt is a disfavored financing source for R&D investment; second, the “Anglo-Saxon” economies typically unveil more sensitivity and responsiveness of R&D to cash flow than continental economies; third, because of financially constrained, the external sources of finance are as much more expensive than internal, and therefore require a considerably higher rate of return to investments.

From a policy perspective, these results denote to the reason why it may be socially beneficial to offer tax incentives to companies, especially to small and new firms. The main rationale for R&D tax incentives is to compensate for knowledge spillovers and should stimulate more investments by firms into R&D than they would have done otherwise. Thus, governments tends to increasingly use R&D tax incentives as a policy tool to support business R&D and the main purpose of business R&D tax incentive is to increase R&D expenditure in an economy.

4. Design features

Tax policy is an increasingly vital component of these incentives. Tax incentives are often chosen for particular design features which generally are not characteristic of direct spending programs. Two design features of tax incentives favor in many countries. First, tax incentives are open-ended entitlements that do not typically require annual spending authorization and are often

unlimited in the amount of qualifying activity undertaken by the private company. Second, tax incentives reduce the scope for discretionary selection of individual firms or projects if they often do not have the pre-approval process or extensive reporting and audit requirements of most government funding programs (OECD, 2016). Table 2 shows the main features of current R&D tax incentives across OECD and selected other countries.

Table 2. Main features of R&D tax incentives in selected OECD and other countries, 2015.

Design of the R&D tax incentive scheme	
Expenditure-based R&D tax incentives	
• Volume-based R&D tax credit	Canada, Austria, Belgium, Australia, France, Chile, Denmark, New Zealand, Hungary, Norway, Iceland, United Kingdom.
• Incremental R&D tax credit	United States (credit on fixed, indexed base and incremental for simplified credit).
• Hybrid system of volume and incremental credits	Italy, Korea, Portugal, Japan, Spain.
• R&D tax deduction beyond 100% recovery	Czech, Belgium, Greece, China, Brazil, Russian, Hungary, Netherlands, South Africa, Poland, Slovak, Turkey, Slovenia, United Kingdom.
Tax relief on wage taxes or related contributions	Sweden, Belgium, France, Hungary, Spain, Netherlands, Russian, Turkey.
More generous R&D tax incentives for SMEs, young firms or start-ups	Australia, Belgium, Netherlands, Italy, Canada, Korea, France, Japan, Spain, Norway, Portugal, United Kingdom.
Ceilings on amounts that can be claimed for specific incentives	United Kingdom, Australia, Norway, Canada, Sweden, Chile, Denmark, France, Hungary, Iceland, Slovak, Italy, Japan, Turkey, Korea, New Zealand, Portugal, Spain, United States.
Income-based R&D tax incomes	Belgium, Luxembourg, China, France, Colombia, Spain, Hungary, Ireland, Israel, Italy, Netherlands, Turkey, Portugal, Switzerland, United Kingdom.
No R&D tax incentives	Germany, Finland, Mexico, Estonia.

Source: OECD (2015c).

During the implementation of a business R&D tax incentive, governments have to select the particular characteristics of design features which the incentive is based, what R&D expenditures qualify for a tax reduction (total volume or volume of increase over a reference base; all categories of R&D expenditure or only intramural/extramural/personnel expense; exact definition of R&D), the target group of recipients, and whether unused claim can be carried over refunded in cash.

The most commonly used types of tax incentives include tax credits or favorable expenditure-based incentives or income-based incentives, on certain types of R&D financing, and are provided directly to R&D researchers in some cases.

Expenditure- based vs. income- based incentives

Most countries providing R&D tax incentives focus the incentives on reducing the cost and encouraging increased expenditures on R&D. This can take the form of credits against income and/or payroll taxes for expenditures on wages and/or capital investment for R&D. Expenditure-based incentives can also take the form of accelerated depreciation, allowing recovery of the investment more rapidly than the underlying economic depreciation of the long-lived asset; or enhanced depreciation, where taxpayers can recover more than 100% of the cost of the R&D expenditure. Enhanced tax depreciation is similar to an R&D tax credit. Enhanced depreciation of 200% of R&D investment (100% more than the actual cost) deducted immediately at a 25% tax rate is equivalent to a 25% expenditure-based tax credit. Accelerated tax depreciation is equivalent to an interest-free loan from the government to the taxpayer, which reduces the cost of the investment and the effective tax rate on the income generated from the investment (OECD, 2016, p.13).

Income-based incentives increase the after-tax rate of return to potentially successful R&D investments, which can attempt to address the market failure from firms not fully appropriating the returns to their investment. Income-based incentives are likely to have similar tax design issues as tax credits that are not immediately refundable. Andrews and Criscuoslo (2013) concluded that income incentives may not be appropriate for innovative firms and might make the playing field unfair. The OECD' study "Supporting investment in knowledge capital, growth and innovation" (2013) shows that a 15% reduction in the corporate tax rate on R&D - create intangible assets transferred to an off-shoring holding company can result in -32% R&D tax wedge, compared to a +16% tax wedge if the R&D is used with a domestic license and production. A study of European Commission in 2015 found that a low tax rate on patent income encouraged shifting of patent registration and taxable income without a considerable change in real economic activity.

Income-based and expenditure-based tax incentives can be designed to provide approximately the same level of tax incentive in present value terms. Modica and Neubig (2016) found that a 15% lower tax rate on future income for a firm earning a 30% pre-tax return on its

R&D investment is the equivalent of a 31% expenditure-based tax credit.

Volume-based vs. incremental incentives, ceilings and other limits

Those incentives aim to the cost-effectiveness of the tax incentives that target tax incentives at firms and activities with the highest productivity- enhancing potential.

R&D tax incentives may apply to all qualified R&D expenditures (volume-based credits) or only to the additional amount of R&D expenditure above a certain base amount (incremental credits). The base amount usually takes the form of a rolling average of several prior year expenditures or a fixed base during a reference period that may be indexed to sales or inflation to stay relevant.

From the firm perspective, the advantages of volume R&D incentives are simple, predictable and likely to benefit mostly large firms in the absence of any ceilings. From the government perspective, the volume-based approach is more costly as some of the support subsidizes R&D.

The features of the incremental R&D incentives are more complex to design and use, higher transaction costs for firms and governments as well as uncertainty about the availability of future subsidies. Incremental incentives are less effective in slow or no-growth economic environments. Finally, incremental incentives can elicit strategic behaviors to time R&D investment to maximize the tax benefits, thus distorting the temporal profile of the R&D investment (OECD, 2016).

In order to manage the overall cost of R&D incentives and target the incentives to smaller firms, some countries apply upper ceilings or thresholds to eligible R&D expenditures or tax benefits. While they reduce the overall cost of the incentive, caps can eliminate the incentive effect of the incentive at the intensive margin (example: an additional dollar of R&D expenditure) among firms with particularly high levels of R&D. Aggregation rules are important elements in minimizing tax arbitrage in the case of ceilings and targeting, as some groups may be component to break down their R&D tax credit claim across separate enterprises to meet size, growth, or young firm eligibility rules.

Cash refunds; carry back/forward, claw backs, and transferability

The value of tax incentives can be significantly reduced if the payments of taxes are delayed or the taxable income or tax liability is potentially lost. Due to concerns about open-ended tax entitlements and low levels of tax audits, most countries limit tax benefits to firms with positive taxable income or income tax liability. Some countries give immediate refunds of R&D tax credits, while others allow taxpayers to either carry tax credits or losses back against prior tax liability (and thus provide immediate refunds) or carry them forward against future tax liability (OECD, 2016).

Given the importance of cash flow for new firms undertaking R&D investment, the delay of

tax benefits until they become profitable and tax paying reduces the effectiveness of the incentive. Many R&D investments made by firms that are not successful will not receive any direct tax benefit. The ability to carry forward tax credits and tax losses is important, but delayed receipt of the credits or losses reduces their value compared to an immediate refund.

Some countries are evaluating whether tax incentives achieve the stated objectives of the program. In the case of some discretionary tax incentives, including R&D investments, if the company does not achieve the projected number of jobs or investment, the government may “claw back” or reclaim the tax incentives. There is an issue of the potential transferability of tax incentives to other companies if the R&D investing company is not able to benefit from the credit or deduction. In many incumbent firms, tax benefits can be transferred to related companies within a consolidated group who can benefit from the incentive. Tax policy design could allow companies to sell the tax incentive, typically at less than full value, to an unrelated company that can immediately use the benefit. This is not an efficient means of providing government incentives, but has been one approach used to get around the tax incentive design limitation of lack of immediate refund-ability due to the open-ended low-enforcement entitlement approach of many tax incentives.

5. Literature studies of the impact of R&D tax incentives

The majority of research explains the additional effects of public incentives policy on firm R&D expenditure.

David et al. (2000) and David and Hall (2002) provide the structural model that identifies the optimal level of R&D investment, as the point at which marginal rate of return (MRR) and marginal capital costs (MCC) associated with R&D investment are equal. Government can stimulate private R&D investment and spur economic development by reducing the marginal cost of capital (MCC) and/or raising the marginal rate of return (MRR) on private R&D investment.

A number of studies have been conducted to assess the effectiveness of tax incentives in boosting firms to spend more on R&D. The evaluation of the so-called “bang for the buck” is a cost benefit analysis to check whether public support partially crowds out private funding for R&D by the tax incentives program. However, factors like spillovers, indirect tax returns, administration costs and the opportunity cost of spending taxable income on R&D support are not taken into consideration in this assessment.

Hall and van Reenen (2000) used in analyzing to estimate the input additionally effect, through econometric estimation of demand equations for R&D. By using ‘user cost of R&D’ model, they conclude that a dollar in tax credit for R&D stimulates a dollar of additional private

R&D investment. However, when the user cost of R&D is a composite measure of depreciation allowance, tax credit, corporate income tax rate, and personal income tax rate, the visibility of policy effects is low. The key advantage of the user cost approach is that it may utilize variations in the generosity of the scheme across firms, and also changes over time. Such variation may be very useful in identifying the effect of the scheme.

Negassi and Sattin (2014) apply meta-regression analysis a sample of 625 t-statistics assembled for more than 60 empirical studies to investigate the overall impact of tax credit on firms' R&D investment. They conclude that lagged R&D, the inclusion of time, industry dummy, level of education and corporate tax rate do not appear to impact the estimated effect of R&D spending.

OECD (2015e) found that direct subsidies are more targeted towards long-term research, while tax schemes are more likely to encourage short-term applied research and boost incremental innovation rather than contribute to radical breakthroughs.

Tax policy research is increasingly being done with firm-level data to reflect differences in types of firms and types of businesses. Tax rate reductions or tax credits that would appear to be a strong incentive for more R&D investment may not be beneficial to start-up companies. Accelerated tax depreciation may help profitable private companies with their cash-flow, but often are not viewed favorably by public companies (Neubig., 2006; Edgerton., 2010; and Zwick., 2016). Tax incentives focused on businesses may be more beneficial to incumbents and multinational companies focused on R&D commercialization, while grants and loans to individual inventors and small businesses may result in more innovative R&D breakthroughs.

Certainty and predictability of tax incentives may be more important than reduction in tax liability for companies that are already taking significant risks in their R&D development and business. Thus, R&D fiscal incentives need to be considered as a part of a country's total tax system, total innovation strategy, and overall economic and investment environment (OECD, 2016).

Summary of Chapter 2

Government can support business R&D in many different ways. Incentive measures include financial support for business R&D activities, tax incentives, accelerated depreciation for R&D equipment, tax exemption for imported R&D equipment and inputs for R&D,... Two most important policy measures are direct funding and tax incentives. In this chapter, the rationale of state support for business R&D, design features of tax incentives policy for business R&D and the impact of fiscal

incentives towards R&D business are illustrated. Governments of developed countries have redirected from policy of providing direct grants to tax incentive policy because these countries want to provide the support in a neutral and objective way rather than targeted intervention. With references to theoretical framework, strengths and weaknesses of each type of policy have been found. Thus, developing countries with limited resources, the tax system not yet developed, and the R&D in businesses are still weak, governments should carefully consider a harmonic balance between neutral and target policy.

Chapter 3

Research methodology

1. Research instruments

This chapter provides an overall picture of the key components of the methodology, including the desk study, the beneficiaries and policy maker's workshops, the questionnaire survey and the subsequent analysis.

The evaluation framework covered the key issues with the five evaluation criteria- relevance, efficiency, effectiveness, impact, and sustainability. This framework formed the basis for the review of the desk materials, for the interviews conducted with stakeholder workshops, for the questionnaire survey among the beneficiaries, and also for the subsequent analysis of the data collected.

1.1 Desk studies

The desk studies included a review of Vietnamese tax incentives policies for R&D business as well as the theoretical background of fiscal instrument to boost R&D investment. The outputs from the desk studies serve as background material in chapter 2. The research on relevant Vietnamese policies and good practices in the world provided background material for the evaluation. The main content of these policies and good practices is summarized in chapter 4 and 5.

1.2. Samples and research design

I had observed the tax incentives in managing the R&D activities of firms. The primary issue I encountered was the availability of detailed information of firm usage of R&D incentives. Due to this limitation, this research utilizes the dataset collected in three steps. First, I sent the surveys to Department of Science and Technology in Ha Noi and Ho Chi Minh City for finding active enterprises in R&D by establishing science and technology fund in the period of 2011- 2014. As the result of the first step I identified 85 R&D active companies. Finally, 53 tax incentives users were found among those active companies.

In addition, I sent the survey to Ministry of Science and Technology for finding high-tech

companies, including FDI companies that connected to innovations and R&D activities. I found that 17 tax incentives users.

Based on the theoretical framework described above, I used a questionnaire to develop knowledge from the persons interviewed. I interviewed policy makers, R&D directors, chief accountants and technical managers to obtain primary information.

The main sources of data collection drawing the overview of business R&D expenditure come from the databases of National Agency for Science and Technology Information and General Department of Taxation. The database of National Agency for Science and Technology Information had based on the results of two national surveys in 2011 and 2013. The database of General Department of Taxation has been established by an annual data of firm's corporate tax reports. During analyzing the databases, I can make comparisons between the levels of its implementation varies across sectors by a cross-sectional design.

1.3. Stakeholder workshops

In order to gather a wide range of opinions and comments on the current tax incentives for R&D business, the stakeholder roundtable workshop is adopted. In practice, 2 stakeholder workshops were conducted. More than 50 selected stakeholders, including policy makers (Ministry of Finance, Ministry of Science and Technology and General Department of Taxation, Chamber of Commerce and Industry of Vietnam), state-owned companies (for example: PVN, Viettel,...), FDI companies and private companies were invited for participation.

1.4. Questionnaires

Questionnaires were sent to state-owned companies and private companies who invest for R&D through establishing their science and technology fund in Ha Noi and Ho Chi Minh City in order to acquire their opinions and attitude about the tax incentives policies. FDI companies were sent survey. Responses to the questionnaires from 41 companies were received, a response rate of 59%. The specific sector of returned questionnaires is shown in Table 3.

Table 3. Result for survey of beneficiaries

	Number of respondent	Respondent rate
State- owned enterprises	12	100%
Private enterprises	19	41%
FDI enterprises	10	83%

The questions in the checklist were designed to obtain information on the key issues concerning policy relevance, efficiency, effectiveness, impact and sustainability. There are certain

similarities between the two checklists some respects, but they served somewhat different purposes. The checklist for company focused on conducting, implementing, effect and impact issues, whereas the other for policy maker was aimed at policy and management issues. The two checklists were delivered to the target groups before the survey and workshop started.

1.5. Analysis of evidence and data collected

The information and data collected from desk study, questionnaires and stakeholder workshops supports in-depth analysis. Based on the findings on the desk study, I identified issues in the sheet that required verification, and took the evidences into account.

In the process of in-depth analysis, in order to ensure the accuracy and reliability of the key findings, a special attention was paid to differentiation between findings related to facts and those related to opinions. The findings related to facts are based on visible results of implementing policies, whereas the findings related to opinions centered on answering questions on some keys issues. Both sets of evidence – one related to facts and the other to opinions- were necessary to develop the main finding for evaluation policies.

The survey constituted a small group, but a high percentage response was received and the opinions were cross-validated through discussions with focus group meetings. I think it is considered valid.

1.6. Challenges and limitation faced by the research

There were limitations in process, methodology or data other than with respect to efficiency. Firstly, efficiency considerations were limited by the absence of value-for-money indicators and the non-available involving database. Secondly, impact and sustainability were difficult for me to assess as the absence of relevance data and time for evaluation was short. The most difficulty was under spending of budget for the field visits to the firms.

2. Evaluation criteria

2.1. Policy relevance

Policy relevance refers to the extent to which the policy's objectives and effect of policy is consistent with the needs of enterprises as well as the needs of national authorities, as formulated in their policies and their priorities.

Relevance is basically a question of usefulness. The assessment of relevance leads to higher-level decisions as to whether the development activities in question ought to be terminated or allowed to continue. The evaluation questions are listed for both enterprises and policy makers, and

present in Annex 1 and Annex 2. Data collected from surveys that had been analyzed in Chapter 5 and Chapter 6.

- To what extent the policy is consistent with the needs and priorities of the final beneficiaries and Vietnam's priorities?
- Are the groups of beneficiaries (including state-owned company, private companies and FDI companies) with the incentives instrument of policy?
- To what extent the current change fits into the needs and priorities of the final beneficiaries and Vietnam's priorities?

2.2. Efficiency

Efficiency indicates the degree to which the achieved outputs have been delivered, and whether they could have been delivered more cheaply or more quickly. A measure of how economically resources/inputs (funds, expertise, time, etc.) are converted to results. Furthermore, assessing the efficiency of an intervention generally requires comparing alternative approaches to achieving the same outputs and this will be easier for some types of intervention than for others.

For the policy makers:

- Is the policy design conducive to efficient achievement of the purpose and objectives of it?
- Has the policy been managed and implemented in an efficient manner?

For enterprises:

- Did the policy clearly identify the critical implementation steps?
- What inputs and resources were compulsory to implement the policy? Were all of these inputs and resources available?
- Has the policy been executed in more cheaply or more quickly or more easily way?
- What are the most important facilitates and barriers to implementation this policy?

2.3. Effectiveness

Effectiveness indicates the extent to which the agreed objectives of the policy have been achieved, or are expected to be achieved, taking into account their relative importance.

Effectiveness can be considered as the direct benefits to the target groups, including state-owned company, private companies and FDI companies.

Explicitly, effectiveness is the relationship between the intervention's outputs, i.e. its products or services – its immediate results – and its outcomes, meaning usually the intended benefits for a particular target group of beneficiaries.

Evaluating the effectiveness of an intervention involves three steps: (i) Measuring for change in the observed outcome; (ii) Attributing the change in the observed outcome to the intervention; (iii) Judging the value of the innovation.

- Has the policy achieved its objectives (purposes, outputs)? (For policy makers only)
- What key outcomes were completed during implementing policy?
- How knowledge is effectively created, commercialized, and diffused?
- How technology transferred is taken?
- How do enterprises boost their investment for R&D?
- How the policy is to reduce the marginal cost of R&D?
- What external factors influenced the implementation?

2.4. Impact

Impact refers to the positive and/or negative, primary and secondary long-term effects produced by a development intervention, directly or indirectly, intended or unintended.

- To what extent the policy influence on the R&D investment and social welfare?
- How well has the policy succeeded to make progress towards achieving the overall objectives (such as: increasing turnover, creating new jobs)?

2.5. Sustainability

The continuation of benefits from a development intervention after major development assistance has been completed or the probability of long-term benefits. The resilience to risk of the net benefit flows over time.

- What are the possible strengths, weaknesses, opportunities or threats that enhance or inhibit the implementation and accomplishment of the policy objectives?
- To what extent is it likely that the changes of policy will implement?

Indicators for the above questions assess the degree of consistency of policy, satisfaction levels of beneficiaries and national authorities and their comment.

Chapter 4

Science, Technology and Innovation system and tax incentive for business R&D in Vietnam

1. Structural reforms to restart growth

Since the transaction of economic reform, Vietnam has successfully modernized its economy and achieved high growth rate of GDP and reduced poverty. In the country's development plan, Vietnam sets out the most important priorities that will become a modern, industrialized country by 2020. To achieve this ambitious goal, growth will have to accelerate and productivity will have to rise rapidly by transforming from the low-valued added sectors towards industrialization, technology and higher productivity. In order to drive productivity growth and diversification in production, it requires for science, technology and innovation (STI) to be applied more effectively in the economy.

The Vietnamese economy began to growth gradually from 2001 and peaking at 8.4% in 2005. Mainly asset bubbles in stock and land markets rather than rising productivity or competitiveness fueled the main reasons for this growth. After 2006, the growth trend turned downward with fluctuation. When looking closer at GDP by economic sectors, we can see that private enterprises contribute only somewhat 10% and that number remains unchanged all the years of 2005-2013. In the meantime, individual economic sector contributes the most for GDP, accounts for roughly 32% from 2007 to 2013. This partly shows the economy development is incoherent (VNR, 2015, p.27)

Levels of labour productivity are still modest in most Southeast Asia; in particular, levels in Vietnam are lower than other countries in the region. Labour and capital accumulations in Vietnam play key economic engines, and TFP has been unable to driver GDP growth. The downtrend of TFP rates in recent years illustrates the decreasing efficiency of inputs. Vietnam's long-term growth prospects are likely to be linked to factors that determine the course of TFP. Even as it builds its economic foundations, maintaining performance requires attention to crafting an innovation system that will lead to steady improvements in factor productivity. As noted by Breu et al. (2012), growth of 7-8% a year in GDP would require a near doubling of growth in labour productivity to 6.4% a year. This would require innovations that increase productivity in existing lines of production and accelerate the transition from light manufacturing and processing activities to higher-value-added medium-technology industries (OECD, 2014, p. 52).

Being enforced protection of IPRs through trademarks, patents, copyrights, etc. fosters the development of innovation system. Vietnam has separate metrology, standards and patent institutions, but it lacks an intellectual property court and technical officials. The lower quality of services and postponing the demand of private firms is caused of the intellectual system being dominated by the public sector. Vietnam ranked 116th out of 148 in the Global Competitiveness Report for Intellectual Property Protection, with a score of 2.9 out 7 in 2013-14; ranked 60th out of

138 in 2016. Comparing to other regional countries such as Malaysia (25th), Thailand (34th), Singapore (2th), and its position is extremely low. To deal with such issues, the government is trying to make domestic firms more aware of how to use the IPRs. The government has also created special market watchdogs, promoted the development of private services, and supported the development of detection and protection of property rights (OECD, 2014, p.71).

Sustainable growth requires fundamental changes in developing country's economic structure, shifting away from intrinsic growth toward productivity-led growth. In order to achieve sustainable Vietnam's economic growth, it requires to gain in productivity stemming from technological catch-up and increase from domestic innovation capabilities.

2. Overview of Science, Technology and Innovation system in Vietnam

According to OECD (2014), Vietnam's innovation system in modern sense is only emerging. It has a number of strengths and weaknesses, which are described in Table 4.

Table 4. SWOT analysis of Vietnam's Innovation system

Strengths	Weaknesses
<ul style="list-style-type: none"> • Strong economic performance and diminishing poverty levels. • Geographical location in one of the world's most dynamic region. • Sizeable labour force and favorable demographics. • Substantial national education effort and good secondary education performance. • Attractiveness for investment by multinational enterprises. • Export strengths in a range of sectors. • Reputation in S&T fields such as mathematics and specialization in agricultural research and biology. • Effort to create and sustain a set of organizations and institutions to support innovation. • Regional initiatives of national benefit. 	<ul style="list-style-type: none"> • Low levels of productivity and income. • Inadequate framework conditions and disincentives for innovation. • Limited access to finance for enterprises. • Inefficiencies in State-owned enterprises. • Infrastructure deficiencies. • Little innovation and even less R&D capacity in the business sector. • Seriously underdeveloped information base for innovation policy making. • Inadequate STI governance arrangements and policy implementation.
Opportunities	Threats

- | | |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> • Further developing the human capital and skills base involving the sizeable Vietnamese diaspora. • Nurturing a dynamic business sector and its innovation capabilities. • Diversifying and upgrading the economy. • Developing a healthy attitude to risk taking. • Improving effectiveness of the innovation system in terms of economic and social impact. • Strengthening inclusive growth. | <ul style="list-style-type: none"> • Unfavorable macroeconomic developments and a slowdown in growth. • Failure to improve the institutional and business environment by tackling banking system reform and corruption. • Failure to prepare for increased international competition. • A looming middle-income trap. |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

Source: Science, Technology and Innovation in Vietnam, OECD 2014, p.28.

Innovation refers to the creation of better or more effective products, processes, technologies or ideas. Evidence from a survey in 2010 of study “Firm-level competitiveness and technology in Vietnam”, most of the innovation taking place among Vietnamese enterprises can best be described as relatively modest in nature, leading to new products or processes at the level of the firm (47% of firms undertaking R&D) and local market (39%), and rarely resulting in anything new internationally (under 2%). These results show that very few firms in Vietnam undertake innovation, and they are thus likely to use technology developed outside of the firm. For those that do innovation, they are in general not creating entirely new products or processes: most firms choose to copy each other rather than innovate.

According to OECD (2014) found that technological capabilities in state-owned enterprises in Vietnam is mixed. State-owned enterprises account for the majority of domestic business R&D expenditure. Newman et al. (2009) concluded that business operating in sector with high concentration of state ownership have higher TFP; this may suggest that state-owned enterprises have some technological leveraging potential. However, state-owned enterprises have lower TFP than foreign-owned businesses. State-owned enterprises are in some cases sheltered from competition and may be profitable without necessarily innovating (Tagscherer., 2010). Intensifying competition should also stimulate demand for innovation.

A sizeable foreign-owned sector has developed in the year since Doi moi. While some parts of the foreign-investment sector conduct R&D, OECD (2014) suggests that they do not always use the latest production method. Interviews with relevant stakeholders suggest few spillovers from multinational enterprises and joint ventures (Tagscherer., 2010).

According to the OECD (2014), the available evidence, while partial and fragmented, points to very weak linkages between science and industry. Businesses account for only 2.8% of the

funding of public research. The 2012 CIEM and WB survey found that only 6% of firms had engaged in innovation-related co-operation with an outside partner and only about 1% collaborated with research institutes and universities. Moreover, many institutes do not actively look for the market, and simply conduct research using their currently available resources without concern for the needs of enterprises. Multi-national enterprises affiliates are not connected to the local research system to find it difficult even to establish supplier relations owing to quality issues.

3. Tax incentives for R&D activities by enterprises as stipulated in legal documents of Vietnam

3.1. Tax incentives as stipulated in science and technology related legal documents

Law on Science and Technology dated on 18th June 2013 stipulates regulations for specific cases getting incentives from tax policies, such as: (i) Incomes are generated from realization of contracts for scientific research and technological development; (ii) Incomes are generated from products made by new technologies applied for the first time in Vietnam or produced during the time of pilot production; (iii) Operation of high-tech based enterprises, high-techs applying agricultural enterprises and some activities in high-tech areas; (iv) Science and technology services; (v) Machines, equipment, parts and materials which cannot be produced locally and need to be imported for direct use in activities for scientific research and technological development; (vi) Financial funds and supports from organizations and individuals for activities of science research and technological development; (vii) Technological transfers by organizations and individuals in encouraged and priority sectors and in socio-economic difficult areas; (viii) Others cases specifically stipulated in tax-related regulations.

3.2. Tax incentives as stipulated in Corporate Income Tax

Law on Corporate Income Tax 2008 and implementation guiding documents govern tax-exempted incomes, as following:

(i) Incomes generated from: realization of contracts for scientific research and technological development; sales of pilot products; and sales of products made by new technologies applied for the first time in Vietnam, the maximal tax-exempted time not exceeding one (1) year since the day of start of production according to contracts for scientific research and technological application, pilot production or new technologies based production (Term 2, Article 4, Decree No.124/2008/ND-CP).

According to Law revising and amending some articles of Law on Corporate Income Tax (Law No. 32/2013/QH13) and implementation guiding documents (Term 3 Article 4 Decree

No.218/2013/ND-CP and Term 3 Article 8 Circular 78/2014/TT-BTC), this above regulation for tax exemption had amended, namely: Incomes generated from realization of contracts for R&D according to legal regulation on science-technology are tax exempted during the time of realization of contracts; the tax exempted time not exceeding three years since the day of turnovers raised from realization of contracts for R&D. Incomes generated from sales of products made by new technologies applied for the first time in Vietnam are tax exempted according to legal regulations and guidelines; the tax exempted time not exceeding five years since the day of turnovers raised from sales of products.

In practice, these above regulations stipulate:

- ✓ Incomes generated from realization of contracts for research and development and eligible to be qualified for tax exemption must meet the following terms and conditions: (i) Having a registration for scientific research; (ii) Being certified by a competent State S&T agency to be contracts for R&D.
- ✓ Incomes generated from sales of products made by new technologies applied for the first time in Vietnam and eligible to be qualified for tax exemption must meet the terms and conditions that the used technologies must be certified by a competent State S&T agency as the technologies applied for the first time in Vietnam.

According to Term 1, Article 18, Circular No.78/2014/TT-BTC governs that incentives in terms of Corporate Income Tax are applied only for those enterprises, which implement the regulations-based system of accounting practice, bills and payment evidences and the self-declaration-based corporate income tax payment.

(ii) Incomes generated from: realization of contracts for scientific research and technological development; sales of pilot products and products made by new technologies applied for the first time in Vietnam including the incomes generated from franchising the certificate of CERs, the maximal tax-exempted time not exceeding one year since the day of start of production according to contracts for scientific research and technological application, the start of pilot production or new technologies based production, the day of franchising the certificate of CERs (Term 2, Article 1, Decree No. 122/2011/ND-CP).

Another point of attention in Law on Corporate Income Tax in 2013 (Term 7, Term 8 and Term 11, Article 1) is: (i) Tax rate of 10% is applied for a duration of 15 years for incomes of enterprises generated from realization of contracts for new investments in sectors of R&D, application of high technologies in the list of prioritized high technologies according to the Law on High Technologies; cultivation of high technologies, cultivation of hi-tech enterprises; high-risk

investment in the development of high technologies in the list of prioritized high technologies according to the Law on High Technologies; (ii) Preferential duration of tax exemption and tax reduction is applied for incomes of hi-tech enterprises, hi-tech agricultural enterprises are eligible for tax exemption for no more than 4 years, and eligible for 50% reduction in tax for no more than the next 9 years; (iii) Enterprises which are established according to Vietnamese Laws are entitled to extract 10% in maximum from annual taxable incomes to raise up Funds for science and technology development of their enterprises. Particularly for State-owned enterprises, in addition to the amounts extracted for the above-mentioned Funds, they are required to secure the minimal rate (3%) for these Funds.

3.3. Tax incentives as stipulated in VAT related regulation documents

Law on Value Added Tax No. 13/2008/QH12, Law reviewing and amending some articles of Law on Value Added Tax No. 31/2013/QH13 and implementation guiding documents regulated that: (i) Commodities classified as not subject to VAT include: machines, equipment and materials classified as impossible to be produced locally and imported for direct use for activities of scientific research and technology development; (ii) The tax rate of 5% is imposed to commodities and services of research and scientific experiments, and S&T services as regulated by Law on S&T.

Nevertheless, it is possible to say about some shortages, which remain in Value Added Tax related documents, namely:

- ✓ Definition of the status of machines, equipment and materials classified as possible to be produced locally, which would be background for identification of those commodities being classified as impossible to be produced locally for direct use for activities of scientific research and technological development;
- ✓ Actual application of Value Added Tax (VAT) payment. Actually, majority of enterprises pay VATs on basis of the invoice method of tax payment first and then reimbursement after. VAT is exempted for S&T products according to Law on VAT, but input taxes are not exempted. This means that the organizations losses for these VATs of input items, such as: materials, equipment, stationary, etc. The situation would turn absolutely different if the tax rate of 0% is applied for products made from activities of scientific research and practical implementation (Hoc, 2005).

3.4. Tax incentives as stipulated in Import-Export tax related legal regulation documents

Law on Import- Export Tax and Law on Customs regulates that the tax exemption is applied for cases: (i) Commodities imported for direct use for activities of scientific research and

technological development; (ii) Materials and parts imported for production purpose in projects of sector classified in the Priority List for particularly encouraged investments. They are exempted from import tax for a five years term since the start of production activities.

According to these implementation-guiding documents, it still has some shortages, namely:

- ✓ There is no detail regulation for criteria to define the status of projects indicated in the Priority List for import tax incentives.
- ✓ There is no clear interpretation for the status of materials and parts imported for production purpose in projects.

3.5. *Tax incentives as stipulated in Personal Income Tax related legal regulation documents*

In all the legal documents related to Personal Income Taxes, such as Law on Personal Income Tax 2007, Law reviewing and amending some articles of Law on Personal Income Tax 2012, there is no term and articles to deal with income tax incentives and the status of beneficiaries in relation to parts of incomes generated from realization of R&D contracts.

In summary, the tax regulations reflect tax incentives for organizations and individuals carrying out R&D activities. These tax incentives offer favorable conditions for enterprises to invest for R&D activities. However, there still have many shortages and limitations in legal documents for taxes applied for R&D activities by enterprises.

Chapter 5 **Data analysis**

This part provides a brief overview of the way to find the performance of tax incentives policies for business R&D in Vietnam through the desk study, the stakeholder workshops, the questionnaire survey and subsequent analysis.

This framework formed the basis for the review of the desk materials, for the interviews conducted during round-table workshops and face-to-face interview, for the questionnaire survey among enterprises and policy makers, and the subsequent analysis of the data collected. This research used quantitative and qualitative method to collect and analyze primary data and to answer these above research questions.

As mentioned above, the period 2008 to 2016 will be taken as the evaluation period. The incentives policies in corporate income tax carried out in 2008. In the course of these policies enormous changes have taken place during this period. In order to study the relevance of these changes, I have to analyze changes in related legal documents over time, and assess whether the policies' objectives and the effects of these policies are consistent with the needs of national

authorities as well as final beneficiaries.

During the desk study phase of the evaluation, I had collected related legal documents, reports and relevant data. The outputs from the desk studies are included as background material of my thesis. As Vietnam is undergoing a period of great changes, many new policies have been promulgated and existing policies have been amended. Relevant legal documents had been studied in order to determine the areas where they conflict.

In the light of these five evaluation criteria, 17 key questions for enterprises and 12 others for policy makers are listed in Annex 1 and Annex 2. These questions are corresponded to one of the five criteria. Participants answered a questionnaire in Vietnamese language. With convenient sampling method, after 1 months of data collection, data were collected from survey and then prepared for statistical analysis with Excel sheet in Annex 3. Analyzing the respondents from 41 enterprises consisting of stated-owned enterprises, small and medium firms, and FDI companies, this thesis has explored how these tax incentives policies had affected to Vietnamese entrepreneurs.

In this study, the five-point Likert scale was used in a manner that provides the response of agreement at -5 different levels. With -5 answer options from Absolutely Disagree to Absolutely Agree, respondents would select the most suitable answer in their own perspective. Opened-questions are designed in a manner that provides the detail comments and opinions concerning about limitations and shortages of these policies as well as the proposals for changes of these policies. Multi choice questions were used to select the several options in their own perspective.

The data obtained through the questionnaire is mainly of ordinal scale. Gathered data were analyzed using Excel sheet in order to determine and present the main information. In this research, Descriptive Statistics was used for data analysis in a quantitative investigation to provide information on the central tendency and the dispersion of the data for all of the 05 variables.

Based on the taking notes during face-to-face interviews and workshops, a major opinions and comments about evaluation the advantages and disadvantages of the current tax incentives policies for R&D activities had been described detail in Chapter 6. All the opinions and comments in two workshops had been recorded. Views on these key comments may vary from interviewee to interviewee. Hence the evaluation process must objectively identify these different comments and assessments based on the facts. Moreover, in order to gather a wide range of views and perspectives, to raise awareness and to help create mutual trust among individual with different viewpoints, the round table workshops had been tested preliminary conclusions about the results of evaluation process, as well as gathered their views and comments on the results. The budget to organize two round table workshops distributed from Ministry of Science and Technology.

Data compilation included the collection, sorting and analysis of data based on existing two

database and annual reports of hi-tech companies. The information to be collected from database of National Agency of Science and Technology Information include data on the business expenditure for R&D whole the country in 2011 and 2013. The database of General Department of Taxation inform data on the number companies among ownership economic sectors, the total amount of STDF and the changes during the period from 2011 to 2015. In these annual reports of hi-tech companies that collected from Department of High Technology of MOST, fiscal statistic had been audited.

One paper with title “Promoting activities of science and technology development funds in business” had been published on Vietnam Science and Technology magazine in 2016. With my colleagues, I had written about the efficiency of tax incentives policies for R&D activities and new points in boosting businesses to invest in science and technology from 2016. The language of this paper is Vietnamese language.

Chapter 6

Evaluating the incentives instruments of corporate income taxes applied to R&D activities in Vietnam

1. Relevance

1.1. Relevance to Vietnamese Government policies

All interviewed officers involving in the designing of financial incentives to motivate enterprises to invest R&D activities agreed that: “the tax incentives policies for business R&D have been issued to meet the need of economic development and the need of enterprises.”

I found that the tax incentives policies are to encourage businesses to deduct pre-tax income to set up Science and Technology development fund (STDE) for enterprises as well as encourage them to invest in high-technology fields, based on the important legal document as follows:

- ✓ Law on Science and Technology 2000, Article 38: "1. Enterprises are permitted to save a portion of their capital to invest in the development of science and technology, in order to renew their technologies and raise the competitiveness of their products. The investment capital for scientific and technological development of the enterprise shall be calculated into the product cost. 2. Enterprises may establish a STDF to make them active in science and technology investment”.
- ✓ Law on Science and Technology 2013, Article 6: "To encourage and create favorable conditions for enterprises to invest in scientific and technological activities, renovation and technological level increase."
- ✓ Law on Technology Transfer in 2006, Article 45: "Enterprises are entitled to deduct a portion of their annual pre-tax profits to set up a STDF to conduct R&D and technological

innovation. Within five years, in case the fund is not used or used for improper purposes, the enterprise shall have to remit into the state budget the enterprise income tax on the pre-tax profit saved in the enterprise plus the interest arising from that pre-tax profit."

- ✓ Law on High Technology 2008, Article 4: "4. Encouraging enterprises to raise their capability to apply high technologies and invest in high technology development; creating favorable conditions for Small and Medium enterprises to join in and forming a network of supplying supporting products and services to the hi-tech industry."
- ✓ Vietnam's socio-economic development strategy for 2011-2020: "Making policies to encourage and support enterprises of all economic sectors to renovate their technologies, to master the key technologies, and to promote the hi-tech products, with priority given to small and medium enterprises."
- ✓ Prime Minister's Decision No.418/QĐ-TTg approving the Strategy for Science and Technology development for 2011-2020 period states that the objective is that "by 2020, science and technology will contribute a significant part to the economic growth and restructure of the economy, value of high-tech products and high-tech application products will account for about 45% of the GDP. The speed of technology and equipment innovation will reach at 10%-15% per year for period 2011-2015 and over 20% per year for the period 2016-2020. Transaction value of the science and technology market will increase 15%-17% per year on average."
- ✓ Recently, in Resolution No.19/2016/NQ-CP dated April, 28, 2016 on keys tasks and measures to improve business environment, enhance national competitiveness in two years 2016-2017, orientation to 2020: "The Government would like to achieve the average of the Asean-4 countries (Indonesia, Malaysia, Philippines, and Thailand) on a number of competitiveness indicators under the effective improvement index by the end of 2017, and the average of Asean +3 countries on the number of indicators of international practice by 2020."

Replies of enterprises show that the permission for establishing the STDF from the pre-tax income reflects the Government's commitment to the business community, and sharing in material between enterprises and society to fund R&D. The Government has made a mechanism to ensure that enterprises save more resources and take full initiative in deciding large-scale and long-term R&D activities. However, a total of FDI companies and 60% state-owned enterprises defined the support they received from tax incentives policies for R&D activities as valuable and essential.

It can be concluded that tax incentives to boost investment in R&D&I are in line with policies of S&T policies as well as socio-economic policy of Vietnamese Government. These are an important method aimed at diversifying the mobilization of social resource for S&T investment, and on the other hand, increasing the efficiency of social resources usage in this field.

1.2. Relevance to the need of enterprises

According to the managers of S&T policies, the deduction of pre-tax income to establish the STDF aims to meet the demand to accumulate the resources for long-term R&D activities in enterprise. The State authorities in charge of tax and science shall have to monitor and supervise the

operation of the STDF of the enterprise because this fund is made up of pre-tax income and the state budget integrates this fund as corresponding to the enterprise income tax rate at each applying point. However, a total of 12 out of 14 policy makers (85%) agreed that the regulations concerning to the management and use of this fund need to guarantee autonomy of enterprises as well as limit the cumbersome procedures in making investment decisions for R&D activities.

From enterprises' point of view, 100% of survey respondent felt that in a competitive market economy, the companies must need to increase investment in R&D to meet customers' demand for quality and price. The enterprise's STDF is a financial resource that will make active R&D activities more proactive and convenient. The survey shows 31 companies' opinions (78% of beneficiaries) felt that in long-term aspect, this fund is more practical than the Business Promotion Fund made from the after-tax profit because of the following reasons: (i) First of all, with the incentive mechanism in establishing funds and "lagging" of five years inactiveness, the company will save a sum of idle capital big enough to invest in R&D and increase the business capital whenever necessary; (ii) Secondly, the STDF of the company ensures that it can accrue low cost capital without paying interest or even earning some interest in case of deposit at bank; (iii) Thirdly, help reducing the cost of R&D investments; And (iv) finally, making indirect impact on movement of enterprise and investor's interest in R&D.

The interviewed policy-makers as well as the enterprises agreed with the view that enterprises investing in hi-tech industries will enjoy the highest level of incentives in accordance with the Law of Corporate Income Tax. Due to the special characteristics of hi-tech activities, enterprises must have enough time to invest in technology, equipment and human resources and, when fully meeting the criteria prescribed in the Law on High Technologies, shall enjoy tax preferences on business income. Tax incentives have generated some tangible benefits through financial indicators for the company, attracting large capital inflows of FDI firms, creating jobs and demand to develop supporting industry in Vietnam.

1.3. Review of policy changes

According to policymakers of MOST (a total of 8 out of 14 policy makers) indicated that Decree 95/2014/ND-CP dated 17 October 2014 provides a series of incentives for research and development spending in both public and private sector enterprises. The State-owned enterprises (SOEs) make up a large proportion of the Vietnamese economy, contributing over a third of GDP and exist in almost all economy sectors. According to Decree 95/2014/ND-CP, SOEs should deduct 3% to 10% of their pre-tax profits into STDFs. If these enterprises do not pay the full amount of this

fund, they will have to transfer all the balances into the S&T development fund of the Ministry or the Province. If 100 large SOEs comply fully with this provision, investment in R&D at those enterprises will equal to the current total public expenditure. The private sector enterprises are also encouraged to invest in R&D up to 10% of their pre-tax profits under many tax incentives. Although expenditure on R&D by the private sector is still very low, policymakers expect that this regulation boost the volume of GERD of Vietnam.

On the contrary, some enterprises (33% out of 12 state-owned enterprises) replied that the imposition of SOEs for deducting R&D funds of enterprises from 3% to 10% of pre-tax profit is quite compulsory. For example, PVEP, a member of PVN's petroleum exploration projects, revealed the company pays corporate income tax annually at a certain percentage of revenue, resulting in possible loss in after tax profit. Therefore, setting a rigid fund allocation rate not based on current actual demand shall cause certain difficulties for business because after profitable years, the company still makes a deduction for other funds such as Complementary, Welfare to ensure the living of employees.

For enterprises investing in hi-tech fields, following the provisions of Article 18 of the High-tech Law on 2008 and Decision 19/2015/QĐ-TTg, to the present time, the Ministry of Science and Technology only issue the certification for 27 enterprises. Accordingly, there are more than 20 enterprises nationwide enjoy corporate income tax incentives. During the process of issuance of hi-tech enterprise certificates, the managers of Ministry of Science and Technology realizes that the criterion of 1% of R&D expenditure and 5% of the total number of employees directly involved in R&D as stipulated in Article 18 of the Law on High Technology in 2008 are only suitable for SOEs deploying R&D activities. However, for enterprises of large-scale annual sales and labor-intensive (ex Samsung, Viettel, FPT...), this rate is not reasonable. As of Samsung Electronics Vietnam Co., Ltd (SEV), with turnover up to hundreds of thousands of billions (in 2013 is 513 thousand billion) and the number of employees up to tens of thousands (in 2013 is 43 thousand people), applying this rate is infeasible. It shows that the criteria of high-tech enterprises being applied is not really effective in selecting companies in high technology filed to provide incentives, to promote enterprises operating in this field manufacturing high-tech products that can compete domestically and internationally. Therefore, in order to promote domestic enterprises to invest in hi-tech prioritized for investment development, and to attract foreign invested enterprises into Vietnam in this field, Decision 19/2015/QĐ-CP issued in 2015 with the criteria for identifying high-tech enterprises as deemed necessary in line with the orientation viewpoint of the Government, as well as practical requirements of enterprises in this field.

It is concluded that the tax incentives policies for R&D activities are relevant to the Vietnamese Government's policy and the beneficiaries, but the data suggest that design improvements might have increased utility further in which incentives instruments for innovation and SME's needs must be focused.

2. Efficiency

2.1. Review on efficiency of deduction, management and operation of S&T development fund in enterprises

2.1.1. Legal system on establishment, management and operation of S&T development fund

The establishment, management and use of STDF of enterprises are regulated in laws, decrees and circulars as following:

- Law on Corporate Income Tax 14/2008/QH12 dated June 3, 2008, Amending and Supplementing some articles of the Law on Corporate Income Tax 32/2013/QH13 dated June 19, 2008 and instruction document.

- Law on Science and Technology 29/2013/QH13 dated 18 June 2013.

- Decree 95/2014/ND-CP dated 17 October 2014 of the Government regulating the investment and financial mechanism for scientific and technological activities.

- Circular 78/2014/TT-BTC dated 18 June 2014 and Circular 96/2015/TT-BTC of the Ministry of Finance providing guidance on corporate income tax.

- Circular 15/2011/TT-BTC dated 09/02/2011 and Circular 105/2012 / TT-BTC dated 25 June 2012 of the Ministry of Finance guiding the establishment, organization and operation of the the Science and Technology Development Fund in enterprises.

- Decision 36/2007/QD-BTC dated May 16, 2007 of the Ministry of Finance promulgating the Regulation on organization and operation of Science and technology development funds of organizations, individuals and enterprises.

In 2016, the Ministry of Science and Technology and the Ministry of Finance issued Joint Circular No. 12/2016/TTLT-BKHCN-BTC dated 28 June 2016 regulating the management and use of STDF in enterprises.

2.1.2. Shortcomings in the system of legal documents regulating the establishment, management

and use of STDF of enterprises

a) Shortcomings and gaps in the implementation of legal document on the establishment, management and use of STDF in enterprises before 2016

Based on the consultation with policy makers as well as the analysis of the findings of the questionnaire survey, the most frequently mentioned issues (by 100% interviewed policymakers and survey respondent) that had delayed implementation were the deficiencies and inconsistencies within legal documents on the establishment, management and use of STDF of enterprises and other legal documents. Details as follows:

- Firstly, in Article 5, Circular 15 and Article 2, Circular 105 (amending Circular 15), the capital served for the Fund is used for the following contents:

“1. To carry out R&D projects of enterprises in Vietnam.

2. Supporting R&D development of enterprises in Vietnam: a) Equipping material and technical facilities for R&D activities of enterprises (building laboratories, testing facilities, machinery and equipment for research and development); b) To purchase machinery and equipment for technological renovation which are directly used in the manufacture system; c) To purchase of technology rights, the right to use and ownership of inventions, utility solutions, industrial designs, S&T information, relevant documents and products for scientific and technological activities in accordance with the Law on Technology Transfer; d) Paying salaries, hiring specialists or contracting with science and technology organizations to carry out R&D activities of the enterprise; e) To pay expenditures on training of R&D human resources in the enterprise according to the regulation on science and technology; f) To pay expenditures for technical innovation and rationalization activities; g) Paying expenses for research and development in science and technology within domestic organizations and enterprises.”

According to the above regulations, the referred contents for enterprises to use the Fund are very broad but lack specific information and relating to documents in many different fields. It is the main cause of embarrassment and confuse during implementation.

- Secondly, in Circular 15, for the regulation of "Implementation of R&D projects of enterprises in Vietnam" in case “R&D projects of enterprises must be developed and implemented according to the State regulations on approval and acceptance procedures (carried out by the evaluation committee for input, the review committee for output)...”

Up to now, there have been no regulations at State level on approval and acceptance

procedures for R&D projects of enterprises. At the state level, however, the Ministry of Science and Technology has issued documents related to the management of state-level projects. The content of the above documents specifies the order, procedures, dossiers for approval, acceptance and use of funds, together with related explanatory forms/final reports on the State projects. Based on these documents, the Department of Science and Technology of provinces and cities have utilized to develop documents specifying the management of projects using S&T budget at local level. At present, R&D projects in case of not accepted will not be finalized as reducing the STDF of the enterprise. Therefore, many enterprises do not dare to undertake research for fear of non-accepted results.

- Thirdly, for the regulation of "Purchasing technology rights, the right to use, inventions ownership, utility solutions or industrial designs"

The characteristic of "Purchase of technology rights, the right to use, inventions ownership, utility solutions or industrial designs" is the process of receiving technology, or the technology transferring (as the technology transferee) to renovate the technology within enterprises. Regarding this content, it is necessary to comply with the current relevant regulations, specific as following:

According to the Decree 133 of the Government detailing and guiding a number of articles of the Law on Technology Transfer, enterprises are allowed to participate in technology transfer for those not prohibited by law. Technology transfer must be in contract. For non-prohibited technologies, enterprises may register or not register technology transfer contract with local agencies responsible for science and technology management (Department of Science and Technology), but once register, they shall be entitled to inherit preferences on relating contents. For those of transfer restricted, it is compulsory for enterprises to register with Ministry of Science and Technology. The list of technologies encouraged for transfer, restricted ones and prohibited ones are defined in Article 5 of Decree 133.

Price of technology is to be agreed among business partners (Article 22, Law on Technology Transfer). However, whenever enterprises use state capital (accounting for 51% or more) to receive technology transfer in investment projects, enterprises must draw up technology transfer plan, which clearly stating the technology transfer content and estimated price of technology for submission to investment competent authorities (Article 4, Decree 133).

- Fourth, for the case of "Purchase of machinery and equipment for technological renovation directly used in product manufacture of the enterprises"

Up to now, there have been no guiding documents from authorities on certification

procedures for the purchase of machinery and equipment for technological renewal of enterprises. However, through practical implementation at local level, in order to have basis for state authorities to certify "machinery and equipment for technological renewal of enterprises to ensure the replacement of part or whole by other advanced technology ", the enterprise needs to develop a project or procurement plan to buy machinery and equipment before purchasing and report the results (including analysis of the current status and achieved results after putting machinery and equipment into use) to the local state management agencies on science and technology (Department of Science and Technology).

- Fifth, for the regulation of “Expenditure for innovation activities, technical rationalization of production”

An initiative is only accredited and adopted by a Council. The composition of the Innovation Council is regulated in Article 8, Decree 13: "The Innovation Council consists of persons with professional qualifications in relating fields, representatives of Trade union where the author is a union member and other components as decided by leader of enterprises"..

The cost for innovative activities includes: the cost of creating the initiative, the cost of applying the initiative, the payment of remuneration, reward for the initiative and the participants in organizing first apply the initiative (Article 16, Decree 13)

Payment from the investor to the initiative creator and other participants to implement the initiative is agreed among themselves. According to Decree 13: "An initiative is a technical solution, a management solution, an operational solution, or a solution for applying technical progress recognized by local level if it satisfies the following conditions: brand new at local that local level; have been applied and tested at local level with possibility of bringing practical benefits; not subject to exclusion under regulation "(Article 3). Thus, an initiative may also be a technology if the solution satisfies the criteria stipulated in the Law on Technology Transfer. "Technology is a solution, process or know-how with or without tools and means to transform resources into products "(Article 3.2). An initiative may also be an intellectual property if it is recognized and protected under the Intellectual Property Law. Therefore, if parties can not reach a common agreement, apart from applying the provisions (Article 10, Decree 13) on initiative, it is possible to utilize the Law on Technology Transfer, the Law on Intellectual Property or the Law on Science and Technology 2013 as the basis for payment whenever appropriate. According to the Law on Science and Technology 2013 (effective from January 1, 2014): "Profits earned from the use, transfer of the right to use, transfer or contribute capital by scientific research results and technology development using the state budget shall be divided at least 30% to the author" (Article

43 of the Law on Science and Technology 2013).

The research also identifies a number of issues that are under the responsibility of state management agencies during making policy, specifically:

- ✓ Firstly, about setting the rate of deduction: Currently, the rate is set at a maximum of 10% of annual taxable income for all types of enterprises (Article 17.1 of the Law on Corporate Income Taxes). This regulation is not suitable for small enterprise. Proportion of funds should be divided into different levels (large, medium, small and micro enterprises). At the same time, it is necessary to "expand the objects to the hi-tech enterprises, newly-established enterprises with no profits, cooperatives and craft villages" as reflected by enterprises' opinion.
- ✓ Secondly, some regulations from the State are not suitable with the characteristic of R&D activities. Detailed as following:

In Article 5.1.1, Circular 15 "Funding for the implementation of R&D projects of enterprises in Vietnam": "The results of the project are evaluated and accepted by the R&D Council. According to the regulations on science and technology, applied to production and business activities of enterprises". It is partially reasonable because R&D activities include many steps: basic research, applied research, experimental development, and pilot. R&D activities are risky, R&D activities from basic research to pilot is not always successful. According to UNESCO, the success rate of basic research, applied research, research and development is 25%, 40% and 60%, respectively. Following the above understanding, the project with fail results (unqualified compared with project target), resulting in inability to apply, cannot use the Fund? Or during research process, the enterprise realize that the application results may fail, and should not be in mass production, but enterprises still have to apply in order to receive Fund? Therefore, in the opinion of enterprises, the paragraph "applied to production and business activities of enterprises" of the above mentioned provision should be removed.

Article 2 of Circular 105 "Expenses for research and development cooperation in science and technology with domestic research organizations and enterprises":

“– Research and development cooperative activities in science and technology under the list of science and technology fields promulgated or permitted by competent agencies for research and development (such as the list of high technologies prioritized for investment, list of hi-tech products to be promoted is promulgated.).

– Domestic research organizations and enterprises are organizations and enterprises

established under the law and functioning in the specialized branches for research cooperation".

R&D activities are diversified, and in some cases, legal documents of the State can not be updated and adjusted in time. Up to now, there are only legal documents on the list of technologies prohibited from transfer, technology limited to transfer or list of technology promoted to transfer (Decree 133); the list of high technologies prioritized for investment development and the list of hi-tech products encouraged to develop; or the list of individual able to establish S&T organizations. Therefore, enterprises are completely allowed to study and cooperate with other research partners on issues not prohibited by the State. Moreover, the cooperation can be from more than two sides, dealing with project serving the need to improve, and enhance the efficiency of business of enterprises themselves, or meet the market demand, if it is considered that the research results are profitable. The form of cooperation may be to send technical qualified technicians to undertake joint research, or to invest together with other enterprises in a S&T organization. Under the circumstances just mentioned, the content of regulation on "Expenses for research and development cooperation in science and technology with domestic research organizations and enterprises" is inappropriate, unrealistic, hindering the development of science and technology in general as well as causing difficulty in settling fund for S&T fund of enterprises in particular.

✓ Thirdly, regarding the nature of the STDF

In some enterprises, when finalizing the use of the STDF, the spending on the projects implemented by enterprises is not recognized by some financial authorities due to the excision of cost norms for projects funded by the state budget under the "Joint Circular 44/2007/TTLT-BTC-BKHCN dated July 7, 2007" (Circular 44): "If the enterprise does not allocate funds for STDF, 25% of these funds must be remitted into the state budget (as corporate income tax). Therefore, enterprises using this fund are considered as using state budget funds "(despite that the capital of the enterprise is totally 100% private). Because of this view, according to the opinion of managers at Ministry of Science and Technology, some enterprises have saved a STDF of 4 trillion Viet Nam Dong, but unable to disburse.

In summary, the reason for the failure of setting up STDF and not use the money in R&D activities, in the opinion of the business, is that most enterprises do not know how to comply with the issued laws and regulations. Some enterprises said that the use of this fund is similar to the state budget with strict control procedures, which is difficult to use actively. With this fund, the state only supports with more than 20% of the cost, the remaining 70% is from the enterprise, so the State should simplify the procedure as well as let the enterprises self-decide on expenditures for R&D activities based on their needs. This (State control) is the main barrier that many enterprises

are hesitant to set up and use the STDF. On the other hand, through assessing the efficiency of policies, it can be seen that unrecognized enterprise' needs as a center in policy design is one of the persistent weaknesses of policy makers in Vietnam.

b) New points in boosting businesses to invest in science and technology from 2016 up to now.

The Law on Science and Technology in 2013 has many new items in encouraging businesses to invest in science and technology. It is worth mentioning that the compulsory provisions for the establishment of the STDF do not apply to all enterprises but only "State owned enterprises have to deduct a minimum percentage of taxable income to make Science and technology development fund of the enterprise" under Clause 2, Article 63 of the Law on Science and Technology 2013. But to ensure that this activity is effectively implemented, the law needs to introduce strong legislation for enterprises to establish investment fund for science and technology. For enterprise that are too small, they can contribute to the local S&T Development Fund so that this fund can be large enough to allow reinvestment in priority order, with one eligible enterprise each year receiving support for technology innovation in accordance with Decree 95/2014/ND-CP (Decree 95). Decree 95 also promulgated new regulations on encouraging enterprises to invest in science and technology development through the establishment of science and technology development fund of their own.

To implement the provisions of the Law on Science and Technology in 2013 and Decree 95, the Ministry of Science and Technology and the Ministry of Finance issued Joint Circular 12/2016/TTLT-BKHCN-BTC regulating the management and use of STDF of enterprise. This circular has been partly solved, as commented by enterprises and policy makers, problems in deduction, establishment and usage of STDF as mentioned above. Specifically:

✓ ***Firstly, Article 7 regulates the use of the STDF to carry out R&D projects***

For R&D projects, enterprises shall be active in performing R&D projects according to their demands. The evaluation, selection and verification of content and funding of the projects will be carried out in accordance with the R&D regulation of the enterprise. Also, the changing point in this Circular as compared with other previous regulations is the R&D projects being evaluated and accepted by the Scientific and Technological Council of the enterprise according to the Science and Technology regulation of the enterprise itself is valid for disbursement. This provision also not limit the location of R&D activities of enterprises "in Vietnam" as previously stipulated, in order to be in line with the trend of international economic integration and operation of Vietnamese enterprises in

other countries worldwide.

Enterprises have the right to set up and issued cost norms for the spending of R&D projects of enterprises. At the same time, it has the right to apply lump-sum expenditures according to cost norms regulation for scientific and technological tasks using State budget. In Item 3, Article 1 of Joint Circular 27/2015/TTLT/BKH-CN-BTC dated December 30, 2015 regulating lump sum for the performance of State budget-funded R&D projects; it is allowed that non-State tasks shall apply the lump-sum expenditure regime.

✓ ***Secondly, Article 8 regulates the use of the STDF to support the infrastructure of science and technology of enterprises***

For the equipment of technical facilities and procurement of equipment, the Circular guides the method to implement these activities. The enterprises will develop projects in accordance with the process and procedure of investment projects and the competent authority of the enterprise shall approve the project as regulated of the Investment Law 2014. Because of previous regulations, purchasing machines and equipment for technological renovation of enterprises must be certified by competent agencies. However, up to now, there have been no documents from authorities guiding the process and procedures for certification to procure machines and equipment for technological renovation of enterprises. Consequently, the application of relevant regulations will facilitate the enterprise to carry out the above procurement and investment activities.

With regard to procuring user right, intellectual property rights, it shall be exercised on the basis of: the explanations of scientific and technological tasks to be considered and reviewed in accordance with the regulation on scientific and technological activities of enterprises and comply with the provisions of purchase or sale contracts, or ownership or use right transfer contracts.

Enterprises may also use the STDF to spend on commercialization and innovation activities such as: expenses for evaluation, piloting, testing and verification, promotion for commercialization of new products; registration of intellectual property rights.

It also is allowed to disburse the expenses for research in project implementation, research and development of new products but new products cannot be consumed or the projects fail to continue by the Scientific and Technological Council due to objective reasons. This regulation is really a tie to business for enterprise than the previous regulations and suitable to the characteristics of undefined and risky implementation of scientific activities.

✓ ***Thirdly, Article 9 stipulates the contents of training human resources for science and technology***

Training activities of scientific and technological personnel in enterprises are those which must be included in the plan and cost estimates approved annually by the enterprise. For training expenses, the Circular determines that the training activities shall be financed by the STDF on the basis of the approved plans and cost estimates and spending cost norms issued by the State. This regulation complies with Circular 96/2015/TT-BTC of June 22, 2015 of the Ministry of Finance guiding corporate income tax under Decree 122/2015/ND-CP.

✓ ***Fourth, Article 10 provides the triple helix in science and technology.***

Recognizing the role of triple helix in science and technology among institutes, universities and enterprises as well as cooperation with foreign research organizations, Circular 12 allows the STDF to cooperate in scientific research and technology with the following content: *"Cooperating in scientific and technological research to solve specific scientific and technological problems or in the fields of science and technology by production clusters and chains bringing competitive advantage to the enterprise"*.

✓ ***Fifth, Article 14 on the treating funds not used, redundant and misleading used.***

The Circular clarifies the formula for determining of the used money from the STDF by the total amount of funds which are already finalized, already advanced and those with full supporting document but not yet finalized complying with the provisions of this Circular and the amount of money transferred from the STDF to the subsidiaries or parent companies.

According to the Law on Science and Technology and Decree 95, the state enterprises must annually deduct 3% to 10% of taxable income to set up STDF in enterprise. In case the State enterprises not yet have demand for using or not using up STDF, they must return them to the national STDF or STDF of line ministries, provinces, cities; with the minimum amount of 20% on the amount of STDF not yet used or used up to 70% of the STDFs already made including receipts (if any).

The circular also stipulates that if the total money used and the one remitted to the national, ministries, branches and localities STDF is still less than 70% of the funds made up, including receipts (if any), the enterprises must pay tax and interest on the remaining funds. The amount of money left after paying tax and interest, the enterprise may use as regulated.

For other enterprises, they are entitled to contribute to provincial or municipal STDFs in where they register their tax payment. The submissions shall be remitted to them whenever required for operation. Or within five years from the year after the deduction year, if the STDF is not used, or not used up to 70% or used for misleading purpose, the enterprise must pay corporate income tax

on the deduction unused, not used upto 70% or used misleading purposes plus the interest on those corporate income taxes to the state budget.

As Joint Circular 12 takes effect in enterprises from September 2016, it will take some time to evaluate the validity of the policy. However, the advantage of Circular 12 is a focus on identifying weaknesses in the implementation of previous policies to overcome and consult more with the business community especially big groups and VCCI in the policy designing progress.

2.2. Assessment of the efficiency of tax policies in encouraging enterprises to invest in high technology activities

During the implementation of verification and issuance the certification of High Tech Enterprise, according to the provisions of Article 18 of the Law on High Technology in 2008, managers of the Ministry of Science and Technology found that the criterion of 1% of revenues for R&D expenditure and 5% of the labor force directly involved in R&D are suitable for small and medium enterprises engaged in high technology. However, for large annual sales and labor-intensive enterprises (ex Samsung, Viettel, FPT...), this rate is not reasonable. As Samsung Electronics Vietnam Co., Ltd (SEV), with turnover of hundreds of thousands of billions (in 2013 is 513 thousand billion) and the number of employees to tens of thousands (in 2013 is 43 thousand people), the regulated rate is not feasible.

2.2.1. Identification of disbursement rate for R&D on total net revenue:

Pursuant to the provisions of Paragraph 1, Article 18 of the Law on High Technology about the percentage of expenditures for R&D, policy makers of Ministry of Science and Technology (a total of 8 out of 14 policy makers) realized that:

- For SOEs: with the total investment capital of less than 100 billion VND, small and medium enterprises only gain a limited revenue, so the ratio of 1% of turnover for R&D expenditure is not big for enterprises desire to invest in high technology development (this figure mainly ranges from about 1 billion to several tens of millions).

- For large enterprises (non-small enterprises defined in Decree 56/2009/ND-CP): with the total capital size can reach thousands of billion, even hundreds of thousands of billions dong such as PVN, Viettel, Samsung.... The ratio of 1% of revenue for R&D expenditure is such huge money.

Considering the data of the enterprises have been granted the certificate of high technology with the revenue from hundreds of billion to thousands of billion, most of these enterprises are at an expenditure R&D on total revenue is higher than 1%, some companies even have higher ratio such

as: Nissei Electric Vietnam Limited Company (from 20%-25%); Nanogen Biotech Pharmaceutical Co., Ltd. (from 6%-12%); MK Smart Joint Stock Company (from 4%-12%); Vietnam Communication Joint Stock Company (from 5% -6%).

However, when considering the data of 2 companies belonging to Samsung Electronics Corporation considered as one of the biggest enterprises in Vietnam (Samsung Electronics Vietnam Co., Ltd.'s revenue is more than 500 trillion, Samsung's SDI Vietnam Ltd revenue is over \$11 trillion in 2013), the spending on R&D expenditure from 2011 to 2013 is: Samsung Electronics Co., Ltd. Vietnam from 0.53% to 0.62%; Samsung SDI Vietnam Limited from 0.43% to 1.72%, respectively. It is significant issue that the cost of technology transfer from parent company in Korea to subsidiaries in Vietnam accounts for a very large proportion of the total annual R&D expenditure of these two companies. This is a different point to allow these companies to apply tax incentives because the Vietnamese Government wants to attract investment capital from these companies into Vietnam.

Thus, in order to encourage domestic and foreign enterprises to invest in high technology, the reduction of R&D spending on large-scale enterprises investing in high technology to 0.5% would be a factor in driving large firms into this field, which would require venture capital rather than other science and technology field.

2.2.2. Identification of revenue from hi-tech products/total net revenue:

High-tech enterprises receive the highest tax incentives for all operation (both high technology and other operations). Hence, the revenue from high-tech products of the enterprise should be achieved as majority in the total turnover of the enterprise.

Almost all enterprises that have been granted hi-tech certificates possess a high percentage of turnover from hi-tech products on total turnover of enterprises, many enterprises have the ratio of over 80%- 90%, some even 99% to 100% of total turnover.

Accordingly, in the current period, it is necessary to attract enterprises in high technology, and managers in MOST as well as enterprises who are interviewed reflect that it should not increase the criteria for the ratio of revenues from high-tech products/total net revenue but keep this ratio at 70%.

2.2.3. Percentage of employees with professional qualifications from university or higher directly conducting research and development / total labor force of the enterprise:

Similar to the above analysis, the number of employees engaged in R&D activities of the

enterprise is decided on the scale of the enterprise:

- For small and medium enterprises, the ratio of 5% as in current regulations is relatively reasonable. A scenario has been calculated on the number of employees stipulated for small and medium enterprises according to the Decree 56/2009/ND-CP dated 30/June/2009, found that: enterprises with fewer than 100 employees, the number of R&D employees is under 5 people; less than 200 employees, R&D is less than 10 people; less than 300 employees, R&D is less than 15 people. These indicators may not be difficult to achieve for enterprises want to invest in research and development of high-tech products.

- For giant enterprises, the number of employees may reach tens of thousands; the rate of 5% is not appropriate.

Considering the data of enterprises, which have been granted hi-tech enterprise certificates and hi-tech application certificates with the number of laborers from dozens to thousands, most of them The percentage of employees directly engaged in R&D activities on the total number of employees is higher than 5%.

However, from data of Samsung Electronics Viet Nam Co.Ltd, one of those most use employees in Viet Nam, after three years the number of employees increase gradually from 18 thousands in 2011 to 43 thousands in 2013, the ratio of R&D also increase by 1.92% (2011), 2.92% (2012), and 3,2% (2013); Samsung SDI Viet Nam Co.Ltd, the total employees increase from more than 500 in 2011 to more than 1.4 thousands in 2013, the ratio of R&D by each year is 6.72% (2011), 5.05% (2012), 5,31% (2013).

Thus, with the number of employees up to thousands, the proportion of employees directly involved in R&D on the total number of employees of enterprises should be lower than that of Small and medium ones with less workforce enterprises.

In the opinion of policymakers at MOST, to encourage domestic and foreign companies to invest in high technology, it is such a driving factor of reduction in the share of direct labor in R&D activities on total labor for large-scale enterprises investing in high technology for large firms' interest in this sector. They think that the ratio of 2.5% is appropriate. At the same time, policymakers also set a floor for this group to ensure that no less than 15 people directly employed as R&D got the university or higher degree. This condition is to ensure that enterprises with 300-600 employees shall have a minimum of R & D workforce of less than 300 employees.

Following the calculation with the number of employees specified is 2.5% for large enterprises: for those less than 1,000 employees, the number of people involved in R&D is less than

25 people; for less than 5,000 employees, R&D is less than 125 people; less than 10,000 employees, R&D is less than 250 people.

Considering actual problems during implementation, managers at MOST also realize that the hi-tech criteria for enterprises (as in Article 18, the Law on high technology) should be revised to make a reasonable scale for different enterprises in size, with detailed consideration of large enterprises with huge revenue and many high quality labours; enhancement of management and evaluation from state authorities on investors complying with commitments, as well as meet the proper requirements of investors by implementation of post-review mechanism on hi-tech enterprises.

Thus, in order to assess the efficiency of the tax incentives policies for R&D activities several factors have been considered, including the shortcomings and gap between a related regulations and practices in real life. Almost of enterprises are not satisfied with the design and implementation efficiency of the incentives instrument, although the efforts of Vietnamese Government have improved the efficiency of these policies. The evaluation found that to improve the efficiency of these policies, Vietnamese Government has to make some significant policy changes that provide privileged treatment to certain types of sector or firm.

3. Effectiveness

Effectiveness indicates the extent to which the agreed objectives of the policy have been achieved. It can be expressed as the direct benefits to target groups identified in the policy design. On the other hand, a commonly used indicator of a country's R&D intensity is the BERD/GDP ratio, which measures the total business enterprise R&D expenditures divided by gross domestic product and provides a simplified method to compare business invest in R&D (Fagerberg et.al, 2006, p.155). In order to make a systematic analysis of the policies' effectiveness, different sources and different samples have been used.

3.1. Total investment of enterprises for R&D activities

Up to now, state budget is still the main resource for S&T activities, account for 70% on total social investment for S&T. Under under-developed scale and development level, total social investment for S&T of Viet Nam is currently below 1% of GDP and the gross expenditure for R&D (GERD) compared with GDP is far lower, only 0.37% GDP in 2013, showing that the level of investment for S&T in Viet Nam is such a tiny comparing with other countries in local area and

worldwide¹. In order to achieve “*total investment for S&T is 1.5% of GDP in 2015 and 2% of GDP in 2020*”, beside of proper and effective use of state budget for S&T, it is necessary to bring current mechanism into practice as well as invent new method, suitable and effective to mobilize other investments for S&T especially from enterprises other than state budget.

An inventory result of R&D in Vietnam in 2013 shows that total social investment in science and technology in 2013 is VND 31,159.2 billion, equivalent to 0.87% of GDP, nearly half of which is spent on R&D.

Table 5. Social investment in S&T and R&D in 2013

Source of budget	Investment in S&T (Billion VND)	Investment in R&D (Billion VND)	Rate R&D/S&T (%)
State	19,560.0	7,591.6	38.8
Enterprise	10,454.6	5,597.3	53.5
Foreign investment sector	1,144.6	201.7	17.6
Total	31,159.2	13,390.6	43.0

Source: S&T book in 2014

With that GERD number, expenditure of GERD on GDP (GERD/GDP ratio) in 2013 is 0.87%, highly increased comparing with 0.21% on GDP in 2011. Similar to BERD/GDP ratio in 2013 is 0.32%, highly increased comparing with 0.19% on GDP in 2011. However, this ratio is still much lower than those of developed countries and ASEAN.

In GERD in 2013, the stated owned enterprises spend 11,595.9 billion VND (account for 87%), non-states spend 1,238.8 billion VND (9%), and foreign capitals spend 555.9 billion VND (4%). Thus, the state owned enterprises (including State Groups, state enterprise) account for prevail rate in total expenditure for national S&T, increases from 81% in 2011 up to 87% in 2013.

¹ In 2013, % of investment for R&D on GDP worldwide is 1.8%, USA 2.8%, German 2.8%, Korea 3.6%, China 1.9%. Source: Battlle, 2014 Global R&D Funding Forecast, December 2013.

Table 6. Expenditure for R&D by implementation regions in 2013

Economic sectors	Total	Implementation regions					
		<i>Research center, institute</i>	<i>University</i>	<i>Administration</i>	<i>State operation</i>	<i>Enterprises</i>	<i>Non-profit</i>
Total national expenditure	13,390.6	4,820.9	712.2	530.4	305.5	6,927.2	94.5
State	11,595.9	4,772.7	698.1	530.4	296.0	5,293.0	5.6
Non-state	1,238.8	48.2	14.1	0.0	9.5	1,078.2	88.8
Foreign investment	555.9	0.0	0.0	0.0	0.0	555.9	0.0

Source: S&T in Viet Nam 2014, S&T publication, 2015

Survey data of National Agency for Science and Technology Information show that in 2013, the enterprise sector accounted for the highest expenditure on R&D (6,927.2 billion VND, accounting for 52% of GERD, doubling from 26% of GERD in 2011). In 2013 there is a special increase in expenditures for R&D from enterprises due to the fact that there are two major entities strongly invested in R&D activities, namely Viettel invests 2,500 billion VND and PVN invests 2,000 billion VND to establish their STDF.

Institutes and centers of R&D ranked second with 4,820.9 billion, 36% of GERD, representing a significant decline from 43.65 percent in 2011. The university sector ranks third, only use 712.2 billion, accounting for 5% of GERD (compared to 14.37% in 2011).

The above data reflect advantage more in R&D in enterprises and the ratio recently approach the current expenditure for R&D of developed countries in the world.

The result for spending for R&D by research fields of the survey show that in 2013, science and technology accounted for most of the R&D spending, with VND 9,057 billion, or 68% of total expenditure; followed by agricultural science, with VND 1,664.1 billion, accounting for 13% of total expenditure.

Table 7. Expenditure for R&D in 2013 by studying field*Unit: million VND*

Studying fields	Total	Implementation regions					
		<i>Research center, institute</i>	<i>University</i>	<i>Administration</i>	<i>State operation</i>	<i>Enterprise</i>	<i>Non-profit</i>
Natural sciences	1,098.4	834.3	178.2	44.6	33.7	0.0	7.7
Technology and science	9,157.0	1,840.1	269.9	220.3	124.1	6,674.8	27.8
Medical	275.4	153.4	42.7	23.0	46.2	0.0	10.2
Agricultures	1,664.1	1,311.7	41.3	155.6	75.8	67.3	12.4
Social science	1,014.6	575.5	143.3	67.1	18.2	185.1	25.3
Human science	181.1	105.9	36.8	19.7	7.6	0.0	11.1

Source: S&T in Vietnam 2014, S&T publication, 2015

Table 8 - expenditure for R&D by sectors and source of funds show that R&D spending from enterprises has increased significantly, almost equal to state budget spending. However, the percentage of enterprise' spending in total national spending on R&D (40%) is still low compared to many other countries. In developed countries, this ratio usually accounts for 60% or more.

Table 8. Expenditure for R&D by sectors and source of funds*Unit: billion VND*

Implementation sectors	Total	By source of fund					
		State budget		University	Enterprise	Others	Foreign
		Central	Local				
Total	13.390,6	4.277,3	3.204,1	110,2	5.352,6	244,6	201,7
Implementation:							
<i>Institute, Center of R&D</i>	4.820,9	3.284,8	436,4	13,5	756,9	188,3	141,0
<i>University</i>	712,2	487,2	73,7	93,9	17,4	19,4	20,5
<i>Operation</i>	530,4	173,5	296,9	0,0	51,7	0,7	7,5
<i>Administration</i>	305,5	96,0	176,8	1,4	18,7	4,2	8,5
<i>Enterprise</i>	6.927,2	192,6	2.207,3	0,0	4.500,0	15,4	11,9

<i>Non-profit</i>	94,5	43,2	13,0	1,3	7,9	16,6	12,4
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Source: S&T Viet Nam 2014, S&T publication, 2015

Gross Expenditure for Research and Development (GERD) in the world in 2011 is 1,394.3 billion USD by purchasing power parity (USD ppp) and average expenditure for R&D (GERD/GDP) in the world is 1.76%. Meanwhile, the one in Viet Nam in 2011 is 0.21%, less than 1/8 of the world average ratio; less than 1/3 of Malaysia (0.7%), equivalent to Thailand in 2007 and higher than Indonesia (0.15%) and the Philippines (0.11% in 2007). For the absolute value, the expenditure on R&D in Viet Nam is far lower due to small GDP, 1/2 of Thailand, and higher than the Philippines.

3.2. Investment of enterprises to set up their Science and Technology Development Fund

Although, since 2007, there have been some guiding documents on the establishment, management and utilization of STDF for enterprises, and until now the number of enterprises with STDF and money spent against total fund for STDF is quite limited. As reported by the General Department of Taxation, by the end of 2015, there are 254 enterprises countrywide with STDF, 57 of which are state-owned enterprises, 8 foreign-invested enterprises, 162 non-state owned enterprises, 7 cooperatives and 20 other businesses. The total amount of the Fund is 3,508,169 million VND, of which SOEs make up the majority share of the total capital. The concentrated areas of STDFs are Ho Chi Minh City and Hanoi. It is noticeable that the number of companies and total amount of STDF increased rapidly after Decree 95/ND-CP had been promulgated and valid.

Table 9. Status of deduction and operation of STDF period 2011-2015

Year	Economic sectors	Enterprises with STDF	STDF capital (unit: million VND)
2011	Total	111	1,465,924
	State-owned enterprises	40	1,183,805
	Foreign-invested enterprises	1	28,000
	Non-state	65	241,846
	Cooperatives	0	0
	Others	5	12,272
2012	Total	97	323,464
	State-owned enterprises	29	84,115

	Foreign-invested enterprises	3	33,450
	Non-state	60	185,747
	Cooperatives	0	0
	Others	5	20,152
2013	Total	122	1,235,225
	State-owned enterprises	47	726,075
	Foreign-invested enterprises	3	31,094
	Non-state	70	474,998
	Cooperatives	0	0
	Others	2	3,058
2014	Total	148	2,721,093
	State-owned enterprises	17	90,299
	Foreign-invested enterprises	2	56,679
	Non-state	35	70,683
	Cooperatives	0	0
	Others	94	2,503,432
2015	Total	254	3,508,169
	State-owned enterprises	57	2,872,222
	Foreign-invested enterprises	8	47,317
	Non-state	162	554,779
	Cooperatives	7	292
	Others	20	33,559
<i>(Source: General Department of Taxation database- Exploited on tax data, tax payer declare by themselves on the declaration form 03/TNDN)</i>			

According to the Department of Science and Technology in Ho Chi Minh City, by August 2015, only 98 enterprises have reported with establishment of the STDF (of which 74 are SOEs. The total fund is 489 billion VND; the number of enterprises using the STDF is 26 and only spends 168 billion VND (34% of the total amount). The establishment of the STDF is one of the criteria for

rating enterprises as well as the expansion of spending purpose for information technology application, are specific policies to encourage enterprises to establish and use of Fund in Ho Chi Minh City.

In Hanoi, as of 26 November 2015, there are 45 enterprises with STDF, including SOEs and non-state owned enterprises, and two S&T organizations.

According to survey results, a total of 5 out of 12 state-owned enterprises (42%) agreed that the group is the unit with the largest fund of setting up and using the STDF. However, there are some groups with large funds but not used up, so they have to refund it, for example: Vietnam Rubber Group, for the period 2009-2014, has been deducted 1,380 billion VND, 42 billion VND was used and the refund was 1,164 billion VND (84%). Basically, the group uses fund to carry out research projects, pilot production projects or research equipment procurement, and also particularly training activities as in case of Vietnam Oil and Gas Group.

The reason for not setting up the STDF as well as using it, in the opinion of 100% respondents, is due to the conflict among regulations as well as unclear guidelines for policy implementation; therefore, most enterprises do not know how to comply with the issued laws and regulations. For this fund, most of respondent enterprises of state-owned enterprise and private companies agreed that the state only supports enterprises more than 20% of the cost, the remaining more than 70% is from the enterprise, so, and the enterprise suggest the State simplify regulations to encourage long-term investment in science and technology.

3.3. Effectiveness of tax incentives/preferences for high-tech enterprises

Since 2012, the Ministry of Science and Technology (MOST) has issued hi-tech operation certificates to 36 organizations, of which 19 have been granted certificates on hi-tech application projects and 17 have been granted certificates on hi-tech enterprise. This is a prerequisite for enterprises to enjoy tax incentives/preferences for hi-tech enterprises. The number of licensed organizations is limited but they are active organizations contributing large capital and hi-tech intellectual capital. The total investment capital of 36 hi-tech organizations was 8,412,134,839 USD, of which FDI accounted for 58% and Vietnamese accounted for 42%. High-tech fields mainly granted certificates in the field of electronics and information technology (accounting for 64%), followed by mechanics and automation (19%), new materials and biotechnology also invested by research institutions, though not much (11% and 6%), but are also encouraging, because almost all fields are interested by Vietnamese enterprises to invest in research and development.

The average revenue from high technology certified enterprises are 19,744,145,391 USD, of which 97% is from hi-tech enterprises and 3% from hi-tech application. R&D expenditures on total revenues of hi-tech enterprises average at 2.34% and R&D expenditures on technology application

projects average at 2.62% (see detail in Table 10).

The total number of people involved in high-tech projects is 21,370 people, of which the average directly engaged in research and development activities is 6.96%. The total numbers of people involved in high-tech enterprises are 42,890, of which 5.21% is directly involved in R&D.

Hence the most indicators to reflect the effectiveness is the extent to which the objects of tax incentives policies have been achieved, such as: the increase of business R&D expenditure, the expanding of number of STDF, the increase of highly skilled labour, the creation of new jobs and turnover. However, the effectiveness effected state-owned groups and FDI companies are positive. On the other hand, private companies, which took part in survey, were relatively minor or had not affected the implementation of these incentives policies.

Table 10. Hi- Tech turnover and R&D expenditure

No.	Name of Company	Type of investment	Date of issuing certification	Total Turnover (Thousand USD)				Hi-technology Turnover (%/total turnover)				R&D expenditure (%/total turnover)			
				Year 1	Year 2	Year 3	Year 4	Year 1	Year 2	Year 3	Year 4	Year 1	Year 2	Year 3	Year 4
1	MTEX Vietnam Co., Ltd	FDI	15/5/2012	23.859	19.753	20.529	15.478	72	69	71	66	1,9	2,4	2,5	2,9
2	Nissei Electric Co., Ltd	FDI	16/10/2012	124.521	107.360	100.786	92.785	81	77	78	79	1,2	1,1	1,2	1,1
3	Nidec Tosok Co., Ltd	FDI	22/8/2013	225.593	270.112	2.146.991		100	100	100		1,5	1,6	1,4	
4	MK Corporate	Vietnam	18/10/2013	11.219	13.917			83	89			4,0	5,0		
5	Nissei Electric Hanoi Co., Ltd	FDI	27/12/2013	82.439	66.143			86	84			2,4	2,4		
6	ATS Co., Ltd	Vietnam	25/4/2014	12.844	13.540			93	92			1,4	2,5		
7	Na No Gen Co., Ltd	Vietnam	23/7/2014	63.436				100				7,2			
8	Samsung Electronics Vietnam	FDI	14/8/2014	18.811.997	16.297.303			95	95			8,0	11,0		
9	Samsung SDI Vietnam	FDI	16/9/2014	652.430	624.008			86	97			1,7	1,6		
10	Sonion Vietnam Co., Ltd	FDI	14/10/2014	83.600				100				1,8			
11	VI Vietnam Co., Ltd	FDI	25/12/2014	43.771	44.746			100	100			2,3	2,7		
12	Namuga Co., Ltd	FDI	11/11/2015	193.048				85				0,7			
13	Kefico Vietnam Co., Ltd	FDI	23/10/2015	125.245				100				2,2			
14	Lap Phuc Co., Ltd	Vietnam	25/9/2015	5.962				70				57,0			

Source: Author collects from MOST

4. Impact

Impact refers to the intended or unintended, positive or negative long-term effects of the development intervention of the tax incentives policies for business R&D. The impact findings are based on the sample of 41 enterprises. The information and data presented were collected from stakeholder workshops, analysis of the returned questionnaires and the desk study. Although diverse information sources have been used the limitations imposed on the measurement of the impact are not negligible. There are several factors that hinder the evaluation of the policies' impact. In particular, it is hard to obtain an overall assessment of impact because only part of the information that relates to impact is available for the sample of 41 enterprises. Therefore, the impact assessment has to be focused on the analysis of outcomes of R&D activities in business.

Enterprises in Vietnam acknowledge that R&D is the key to successful competitiveness of an enterprise. The sustainable development of an enterprise must be closely linked to R&D. R&D is like putting money in advance and collecting results later, and if business leaders are not aware of R&D, and make no long-term investment orientation for R&D, it is hard for them to "survive" in the current fierce competition conditions. The impact of policies encourage enterprises invest in R&D activities has not been measured in Vietnam. However, within the scope of this study, some evidence on policy impact on the performance of some key enterprises in Vietnamese economy has been demonstrated. Details as follows:

The Viettel Group, the largest telecoms and technology company in Vietnam, is a clear evidence of effectiveness in policy to encourage enterprises to set up a STDF. Viettel understands that any competition, whether between enterprises or between countries, it is ultimately depends on the ownership of science and technology of the enterprise.

In 2011, Viettel established Viettel Research and Development Institute, deducting 10% of pre-tax profit for the Science and Technology Development Fund, equivalent to 2.5 trillion dong. With this capital, Viettel is totally able to invest in large-scale research projects, thereby realizing the objective of building Viettel Research and Development Institute as a strong research, mastering the telecommunication equipment, from terminals, access to the core equipment. It is reflected from the fact that, after a short time, the most important products for the information and telecommunication industry that Viettel Institute of Research and Development provided has met the needs of enterprise development, with the price of one third as compared with market price. According to representatives of Viettel, who had participated in roundtable workshop, said that Vietnam is newly participated, with limited experience, and small market, therefore, it is highly necessary to receive a support from the State through tax policy, especially for enterprises to

produce end-user products as high-tech equipment, of and for social benefits. To carry out the task of mastering technology, research and production, Viettel chose the main method of self-operation, combined with partial technology transfer from partners and expert cooperation; organizing the research units abroad, then transfer the research results back to the country in the form of specific products and intellectuals in professionals and experts of the company. Viettel has gradually mastered the process of research, manufacture high-tech military equipment and civilian equipment, and ready to perform and fulfill assigned tasks. Viettel has studied, designed and successfully manufactured cordless fixed telephone, namely Homephone HP 6800; dedicated phone for offshore fishermen as SeaPhone 6810; designed and successfully pilot manufactured 100 models 3G USB Modem device branded Viettel. For high technology equipment, according to the philosophy of Viettel, domestic enterprises are now mainly processing assembly and only when fully mastered the technology than integrate high added value into these new products, highly competitive, and this movement requires a timely support of the State through specific and feasible policies.

Following these business philosophies, at present, Viettel's scientific and technological research activities bring out revenue, in particular, the ones from research-manufacture reach 7,600 billion VND by 2015 and 10,500 billion by 2016 VND, percentage at 36% per year. Viettel's revenue has increased 6,300 times, from 36 billion VND in 1999 to 228,000 billion VND in 2016. In 2016, Viettel contributed 40,521 billion VND to the state budget (by 11,900 times in 1999). In telecommunications, Viettel has invested in 11 countries with the total population of 320 million people, of which 100 million are customers. Each year, Viettel spends 4,500 billion VND for research and development. In 2020, Viettel will successfully build a hi-tech defense industry complex with turnover of USD 2 billion.

FPT Technology Research Institute is built on a reference model from a research institute in Stanford University (USA), but adapted to the realities in Vietnam and FPT. In particular, the Institute focuses on the industry sector, attaching scientific research projects to business needs of enterprises. Since it is founding, FPT Research Institute has received many "orders" from member companies in FPT Corporation to develop its products/services, for example: Smart e-Click Adnetwork for FPT Online since 2013 based on large data mining and natural language processing. E-Click now brings in new revenue, accounting for 5% of the company's total online advertising revenue. In 2014, FPT Technology Research Institute invested 4 billion VND to support scientific research.

In the development strategy of PVN - the country's leading economic and technical Group, S&T plays a decisive and breakthrough role in the whole process of oil and gas industry from oil and gas exploration and production, processing, power industry and high quality petroleum

services. S&T activities in PVN are currently being carried out in all steps, oil and gas economy, management, safety and environment. In addition to constantly building up strong potentials in science and technology, investing in modern equipment and technological innovation in production, S&T research programs of PVN include long-term, oriented research directions, as the basis for implementation of S&T plans for each year, ensuring the targets and in line with PVN's development strategy. The theoretical contents and research programs, from laboratory to simulation, testing on the fieldwork and practical application are all-feasible for business activities of PVN, some research contents are advanced short-cut with orientation as the basis for planning long-term development strategy. The results are continuous development and enhancement of S&T potentials in a synchronous and reciprocal manner, mastering and improving technology, linking scientific research with applying, and transferring advanced technology into business activities of PVN in recent years. The outstanding achievements of science and technology, application and renewal technology of PVN over the past years are confirmed by impressive figures: 7 inventions, patents. Subordinate units had 1,482 initiatives, bringing benefits of 5,426 million USD and 3,626 billion VND; The Group had 30 initiatives with benefits of 23.95 million USD and 2.532 billion VND.

My Lan Group established in Tra Vinh, founded by Dr. Nguyen Thanh My, an overseas Vietnamese scientist. Three investment projects of My Lan Group in Tra Vinh include: chemicals, optoelectronic materials and printing materials (production of zinc plates under CTP technology), with a total investment of about 20 million USD (over 400 billions dong). There are only 11 factories producing optoelectronic materials in the world, and the 12th factory is My Lan Group. Starting from the desire to produce optoelectronic products with advanced technology, training qualified chemical engineers to contribute to the scientific and economic development of Tra Vinh in the future, My Lan Group also cooperated with Tra Vinh University to establish the Faculty of Applied Chemistry, training in two disciplines: Flexible Plastics Chemicals and Nanotech products - Printing Technology. The experienced engineers of the Group have guided the students and the Group is where the students can practice the research/carry out their probation. My Lan Group is also committed to accepting all students who are studying and graduating to work in My Lan. According to the opinion of S&T managers, My Lan Group is a model of connecting universities and enterprises.

Thus, from some of the success stories outlined above, the stakeholders hold strong opinion that these incentives policies to boost R&D activities have helped enterprises master new technologies, create competitive products, thereby ensuring the ability of development in domestic and foreign markets. At the same time, in terms of social benefits, these enterprises have

contributed to creating more jobs society's sustainability and development.

5. Sustainability

The stability of tax regulations and a broader support from the State for R& D has long been recognized as a key factor in the success of tax incentives/preference for R&D. Evidence indicates that the impact of R&D policies may be impaired if they are unstable (Guellec et al., 2003). A stable policy environment and predictability of tax exemption can improve the cost-effectiveness of the enterprises, allowing them to plan their R&D investments, encouraging more companies to adopt tax incentives. The critical aspects of sustainability are therefore to determine which aspects are required to improve or change and determine how these essential aspects are to be improved or changed.

Approximately 82% of policy makers and 75% of respondents of the enterprises in my survey evaluate tax incentives policies that encourage companies to invest in R&D as follows:

Strong points:

- The Government built policies to encourage enterprises in investment of R&D activities.
- Enterprises are aware of the role and importance of science, technology and innovation.
- The government has made reforms in line with the actual needs of the enterprises.
- Incentives made on enterprises with R&D unit.

Weak points:

- Policy design is not synchronized with other related policies.
- Weak policy implementation, many branches and inconsistency.
- Complicated, unclear and non-transparent tax procedures.
- Weak R&D capacity of enterprises; Weak in R&D, relying little on local knowledge producers for local enterprises; Tend to rely on their home country R&D organizations for FDI firms.
- Loose collaboration between Institute – University - Enterprise, no clear incentives policy.
- Technology mastering not promoted in FDI enterprises.
- No specific policy to promote innovation development.

Opportunities:

- The Government shall commit to supporting business development, taking enterprises center for economic development.
- Viet Nam continues attracting foreign direct investment.
- STI system is changing and applying good practices from the world.

Challenges:

- Slow reforms in taxation, cumbersome paper work, time and money consuming.
- Government's capacity for policy-making is quite limited.

Based on the above assessment of the strengths, weaknesses, opportunities and challenges of tax policies in encouraging enterprises to invest in R&D, more than 90% of companies and policymakers interviewed are agreed with the following points of view:

- The State should continue to implement tax policies to encourage enterprises in investment in R&D and innovation.
- Policies should be designed to match actual needs of the company based on the good practices in the world.
- To formulate policies to encourage the triple helix between Institute - University - Enterprise.
- The research, establishment of mechanisms and policies to encourage enterprises to invest in R&D activities should be considered carefully and in accordance with the law and related regulations. Review and provide specific guidelines on financial incentives for enterprises; build and improve the regulatory environment to enable enterprises to participate and invest more in research and development activities.

It is a conclusion that certainty and predictability of tax incentives is an essential instrument than the reduction in tax liability for companies that are already taking significant risks in R&D activities. R&D fiscal incentives must be consider as a part of a country's tax system, innovation strategy, and overall economic and investment environment.

Chapter 7

Conclusions and recommendation

R&D tax incentives are one of the most popular innovation policy tool that help reducing taxes for firms with R&D expenditure. These incentives decrease the price of R&D inputs faced by firms, which makes it more attractive to engage in R&D, and spur innovation. R&D tax incentives encourage firms to invest in innovation or to attract FDI companies into long-term economic performance and job creation.

According to analysis in Chapter 6 on tax incentive policies for R&D in terms of relevance, efficiency, effectiveness, impact and sustainability, Vietnamese Government is considered to favour tax applying for R&D in enterprises. However, these policies show some shortcomings and inconsistencies among relating regulations, the policy is only stamped on a small number of

enterprises and focusing FDI and state-own ones. The impacts of policies are still unclear and insufficient of data for detailed measurement and evaluation. The designs of tax incentive policies are not follow common trends in the world and apply good practices in implementation. The tax policy is also unstable and changing over times, causing negative responses in the attitude of enterprises as they want to approach and inherit benefits from those policies.

With the available evidence, results from the survey, face-to-face interviews and workshops and the above evaluation of current tax incentives policies in Chapter 6, a number of key recommendations come of out this synthesis that can help to improve the advantages arising from introducing provision aimed at managing the effective and efficient feature of R&D tax incentives.

1. Improvement of effectiveness in design of public policy

Policy formulation is considered as the second step in the policy process. This is a critical important start. As a proper and scientific foundation shall construct a good policy and a premise for the policy integrate in daily life and proved effectiveness.

Firstly, the most important issue in policy formulation is capacity building for policy makers. Establishment of policy makers with high quality and grand vision on all issues (human resource is the core power of a qualified policy, meeting people's need and effective implementation). The Government of Vietnam need improve capacity of policy makers by providing training course and basic learning of advanced education programs to approach standard methodology and good practices in the worldwide.

Secondly, Vietnam shall ignite a new public policy process with the participation of all involved parties. Currently, public policy process is not stemming from problems identification but affection and methods from policy makers, resulting in infeasibility and obstructions. Therefore, enterprises must be placed in the center of public policy process, and enterprises' needs a basic for policy decision. Policy should be built in accordance with the requirement of company, improving the development of enterprises, minimize administration procedure, bringing clearance and transparent to easier implementation.

Thirdly, Vietnam shall renew the public policy making by democratic process. To enhance policy agenda setting among the Government and benefit groups, especially enterprises. Dialogue channels shall also be created and maintained as regular talks among the Government and benefit group for ideas, requirements of benefit groups better transmitted in the fastest ways to authorized agencies. With reference to tax incentive for business R&D, the development of policies based on

meaningful dialogue and collaboration between business leaders and policy-makers contributing to more informed and thoughtful policy development, limiting unintended negative consequences.

Fourthly, a consistent and predictable policy environment is a significant improvement. A capital investment and workforce hiring decisions for R&D activities have long term consequences, often 5 to 10 years or more time horizons, establishing policy predictability over longer time periods facilitates the setting of business and investment strategies with greater confidence and enhances the ability to commit to stakeholders. Related tax incentives across OECD countries increase in principle the predictability of tax support among firms facing uncertainty about their tax profits.

Fifthly, individual policies and the overall policy bundle must be financially affordable and reasonable for business and society. The costs associated with policies should not outweigh the benefits.

Finally, a closed cooperation shall be created among Ministries in public policy process to avoid contradictions. Policies create institutional legitimacy based on national benefits. Policy-makers should strive to reduce the fragmentation and complexity of today's policy environment through the synchronization and harmonization of national, and/or local policies and across agencies and branches of government.

Thus, the good policies must be communicated to and understood by all who are affected by them; they should be stable and consistent. Policies must be also consistent within the totality of the entire system, value and goals, sincere and realistic. Policies should consider the future and be outcome-oriented.

2. Integrated and smart reforming in tax incentives policy for R&D&I

The Government of Vietnam needs integrated and smart reforming in tax policy, which encourages Vietnamese business community as well as foreign investor for R&D&I, especially in advanced, less labour and R&D oriented industries.

According to current Law on Corporate Income Tax, individuals and organizations in Vietnam has the obligation of paying tax after selling their products. This also means that tax on R&D activities are incurred only when the products of R&D traded, sold and applied in actual business and daily life. Thus, by the current policy, the cost for R&D is only deducted in taxable income whenever products of R&D commercialized, or else, not counted as cost in tax period. In order to overcome this illogic, the

Government of Vietnam has allowed enterprise to build and operate STDF for expenditure of future R&D activities. In Chapter 6, there are lots of evidence of bottleneck in design and implementation of regulation relating establishment and operation of STDF. As well as only few enterprises benefit from tax incentive policies for R&D activities in practice.

Therefore, in the process of designing tax incentives for R&D, the first issue needs addressing is the elimination of bottlenecks, as discussed in Chapter 6, and emerging issues to assist enterprises in increasing investment in science and technology. At the same time, studying and learning good practices in the worldwide to design policies tailored to the characteristics and needs of different types of businesses, focusing on those industries within Vietnam's development priority. Some specific suggestions are as follows:

- The definition of R&D costs and other activities (innovation, etc.) should be defined to ensure uniform application of R&D costs whenever determining R&D costs, tax exemptions or reductions, of which definition of commonly applied countries can be used, such as the OECD Frascati Manual 2015.
- Allowing totally current expenditures for R&D activities (salaries, wages paid to research personnel, raw material costs, etc.) are considered as business expenses and deducted from taxable annual income of the enterprises.
- Allowing the enterprise to deduct 100% of the development investment expenses (expenses for equipment, etc.) in the expenses-incurred year as enterprise's annual income tax returns. At the same time, it allows rapid depreciation of warehouses used for R&D activities.
- When designing R&D tax incentive policies, the government needs to make some important decisions, such as which target groups to choose (e.g., by business scale); which spending items to spend on R& D (e.g., operating expenditures, R&D labor costs, or total R&D spending, spending on innovation, research collaboration, or hiring third parties for collaborative research). The government also needs to choose the type of tax incentive, such as an allowance, exemption, deduction or credit.
- In the process of implementing tax incentive policies that encourage businesses to invest in R&D, an advisory committee should be available to assist the Government quickly identify the needs of policy beneficiaries in method of support and challenges of enterprises during policy implementation. On that basis, help the Government to detect the content that needs to be adjusted in policy.

- A supporting agency for implementation of tax incentive policies to boost business R&D activities needs to be formed to provide information and support services such as the provision and development of tables and forms, seminar; monitoring and evaluating progress in policy implementation, ...

3. Providing policies to encourage small and medium enterprise and young firms more invest in R&D activities

Currently, the investment demand in science and technology of enterprises is not great because Vietnam still adopts the economic growth model by scale, in which industries with more capital and labor are concentrated. Vietnam's state-owned enterprises hold a monopoly position in the market, which is favored by the government, even covering both input and output. In such a less competitive business environment, the demand for technological innovation and product quality improvement will certainly be limited. Globalization has become more and more widespread, asking Vietnam to quickly shift to a development model by depth based on superiority in product quality. To meet those requirements, the investment demand for science and technology to modernize the production process of enterprise must also bigger.

In private companies sector, mostly small and medium enterprises, despite of small scale and weak competitiveness, contribute more for the whole economy, account for more than 40% GDP, 30% of total industrial value. The private companies also present 35% of total social capital and attract 51% of labour force nationwide. Therefore, it is necessary to establish encouraging policies for SMEs to invest in R&D suitable with characteristics of this type of enterprises.

Innovation in financial direct support for enterprises by some methods, to attract capital from private sector and enterprise in science and technology by improving public-private mechanism, leading role of the State in grants, favored loans, risk guarantees, such as:

- The counterpart mechanism which enable one capital value from the State attracts for two capital values from the enterprises (based on serious evaluation of enterprises' financial health)
- Favorable mechanism for Institute/University attracting to the enterprise's investment for R&D activities, as one capital value from enterprise shall receive two support values from government

- Risk guarantee: If a project invested by the State as favour loan, part of it can be converted to grant
- Mechanism of advance fund raising (seed funding) from the State for start-up enterprises in innovation with high potential development growth.

Based on policy assessment in the world, studies show that the age of the business is more important than the size of the business, and the ability to generate employment, knowledge diffusion and social return to R&D are important factors in policy selection for targeted enterprise groups. Small businesses and young entrepreneurs respond quite positively to tax incentives for R&D activities than large firms. For the design of tax incentives for small and medium enterprises, Vietnamese Government should apply some good experiences from other countries in designing oriented policies for SMEs and young enterprise as follows:

- Most countries focus in making policy of tax incentive for SMEs, few of them make policy for start-ups and young businesses.
- Applying common methods like tax credit and allowance based on total R&D volume-base cost, as well as permission of carry-forward provision for at least 5 years.
- For basic research activities, is allowed to apply cash refund or reductions in social security and payroll for researchers.
- Scientists in Vietnam are mostly in public research institute and university. Therefore, in order to improve innovation and spreading knowledge, transforming resources from basic research to commercialized oriented research in public research institute and university, the Government should encourage research among enterprises, universities, and research institutes by tax incentives. At present, there are OECD countries, namely Belgium, France, Iceland, Italy, Japan and Hungary applying tax incentive policies for research and cooperation activities.
- The incentive tax policy for R&D investment should be stably implemented in long-term to create positive affect to investment in R&D.
- The Government should maintain the tax incentive for investment in R&D activities bring practical benefits to enterprises, through effective ex-post evaluation linked to the ex-ante assessment of reforms and new initiatives. However, the assessment is only assured by a proper database system and research base analyzed.

Moreover, due to the high risk level in investment of science and technology development,

while the protection of intellectual property rights in Vietnam is low, it is requested that other “non-finance” conditions must be present, as long as improvement of business environment, orientation of economic development, as well as improving the legal system for the protection of intellectual property rights ... Only when creating a fully favorable environment for the creation and application of science and technology achievements, can mobilize capital from different sources to invest in science and technology, after all, to the enterprise sector, because of its profit hunting characteristic, R&D investment will only increase when the companies are profitable.

In order to advance the existing evidence on the impact of public support for business R&D by tax incentives, the further research seeks to explore at firm-level the extent to reflect differences in types of firms and types of businesses; and statistical impact of public support in whole country that is based on microdata to analyze. The research will contribute to informing country’s decisions that they need to have in place a system of monitoring and evaluating their tax policy decisions.

Annex 1

SURVEY FOR BOOSTING BUSINESS R&D ACTIVITIES

Dear Sir/Madam,

I would like to ask for your cooperation in filling out this questionnaire, which is aimed to boost R&D activities in enterprises. This research is focused on business R&D activities in Vietnam and tries to find some helpful implications for Vietnamese policymakers in the context of increasing business R&D activities. All information will remain as confidential and used for scientific purposes only.

Thank you very much for you time.

Researcher: **Nguyen Hong Van** – University of Tampere (Finland)

QUESTIONNAIRE

1. To what extent the policy is consistent with the needs and priorities of the final beneficiaries and Vietnam's priorities?

☐ Yes

☐ No

☐ Further comments:

2. Are the groups of beneficiaries (including state-owned company, private companies and FDI companies) with the incentives instrument of policy?

☐ State-owned company

☐ Private company

☐ Other (please verify):

3. To what extent the current change fits into the needs and priorities of the final beneficiaries and Vietnam's priorities?

	Absolutely Disagree	Disagree	Partially Agree	Agree	Absolutely Agree
Well- designed	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Very helpful and supportive	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Not overly bureaucratic	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Poorly designed	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

4. Did the policy clearly identify the critical implementation steps?

	Absolutely Disagree	Disagree	Partially Agree	Agree	Absolutely Agree
Well- designed	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Very helpful and supportive	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Not overly bureaucratic	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Poorly designed	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

5. What inputs and resources were required to implement the policy? Were all of these inputs and resources available?

- ☐ High skill experts or engineers
- ☐ Technical facilities machinery and equipment
- ☐ Technology rights (patent, knowhow...)
- ☐ Internal and/or external fund
- ☐ Further comments:

6. Has the policy been implemented in more cheaply or more quickly or more easily way?

	Absolutely Disagree	Disagree	Partially Agree	Agree	Absolutely Agree
Well- designed	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Very helpful and supportive	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Not overly bureaucratic	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Poorly designed	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

7. What are the most important facilitates of and barriers to implementation this policy?

- ☐ Clear R&D definition for tax purpose
- ☐ Efficiencies and consistencies within current legal document
- ☐ Sufficient tax liability
- ☐ Clearance and transparent administration procedure
- ☐ Predictability of tax support
- ☐ Deficiencies and inconsistencies within current legal documents
- ☐ Further comments:

8. What key outcomes were completed during implementing policy?

- ☐ High skill experts or engineers
- ☐ Technical facilities machinery and equipment
- ☐ Technology rights (patent, knowhow...)
- ☐ Increasing turnover
- ☐ Further comments:

9. How knowledge is effectively created, commercialized, and diffused?

- ☐ Very useful
- ☐ Limited
- ☐ Not available
- ☐ Further comments:

10. How technology transferred is taken?

- ☐ Widely available
- ☐ Limited
- ☐ Not available
- ☐ Further comments:

11. How do enterprises boost their investment for R&D?

- ☐ Yes
- ☐ No
- ☐ If yes then please specify how:

12. How the policy is to reduce the marginal cost of R&D?

- ☐ Yes
- ☐ No
- ☐ If yes then please specify how:

13. What external factors influenced the implementation?

- ☐ Closed collaboration between university/institution
- ☐ Other funds
- ☐ Further comments:

14. To what extent the policy influence on the R&D investment and social welfare?

☐ Yes

☐ No

☐ If yes then please specify how:

15. How well has the policy succeeded to make progress towards achieving the overall objectives (such as: increasing turnover, creating new jobs)?

☐ Yes

☐ No

☐ If yes then please specify how:

16. What are the possible strengths, weaknesses, opportunities or threats that enhance or inhibit the implementation and achievement of the policy objectives?

☐ Yes

☐ No

☐ If yes then please specify how:

17. To what extent is it likely that the changes of policy will implement?

☐ Quick/ informative/ not overly bureaucratic

☐ Well designed

☐ Further comments:

Annex 2

SURVEY FOR BOOSTING BUSINESS R&D ACTIVITIES

Dear Sir/Madam,

I would like to ask for your cooperation in filling out this questionnaire, which is aimed to boost R&D activities in enterprises. This research is focused on business R&D activities in Vietnam and tries to find some helpful implications for Vietnamese policymakers in the context of increasing the investment of business for R&D activities. All information will remain as confidential and used for scientific purposes only.

Thank you very much for you time.

Researcher: **Nguyen Hong Van** – University of Tampere (Finland)

QUESTIONNAIRE

1. To what extent the policy is consistent with the needs and priorities of the final beneficiaries and Vietnam's priorities?

☐ Yes

☐ No

☐ Further comments:

2. Are the groups of beneficiaries (including state-owned company, private companies and FDI companies) with the incentives instrument of policy?

☐ State-owned company

☐ Private company

☐ Other (please verify):

3. To what extent the current change fits into the needs and priorities of the final beneficiaries and Vietnam's priorities?

	Absolutely Disagree	Disagree	Partially Agree	Agree	Absolutely Agree
Well- designed	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Very helpful and supportive	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Not overly bureaucratic	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Poorly designed	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

4. Is the policy design conducive to efficient achievement of the purposes and objectives of it?

	Absolutely Disagree	Disagree	Partially Agree	Agree	Absolutely Agree
Well- designed	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Very helpful and supportive	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Not overly bureaucratic	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Poorly designed	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

5. Has the policy been managed and implemented in an efficient manner?

☐ Yes

☐ No

☐ If yes then please specify how:

6. Has the policy been implemented in more cheaply or more quickly or more easily way?

	Absolutely Disagree	Disagree	Partially Agree	Agree	Absolutely Agree
Well- designed	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Very helpful and supportive	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Not overly bureaucratic	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Poorly designed	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

7. Has the policy achieved its objectives?

☐ Yes

☐ No

☐ If yes then please specify how:

8. What key outcomes were completed during implementing policy?

☐ High skill experts or engineers

☐ Technical facilities machinery and equipment

☐ Technology rights (patent, knowhow...)

☐ Increasing turnover

☐ Further comments:

9. To what extent the policy influence on the R&D investment and social welfare?

☐ Yes

☐ No

☐ If yes then please specify how:

10. How well has the policy succeeded to make progress towards achieving the overall objectives (such as: increasing turnover, creating new jobs)?

☐ Yes

☐ No

☐ If yes then please specify how:

11. What are the possible strengths, weaknesses, opportunities or threats that enhance or inhibit the implementation and achievement of the policy objectives?

☐ Yes

☐ No

☐ If yes then please specify how:

12. To what extent is it likely that the changes of policy will implement?

☐ Quick/ informative/ not overly bureaucratic

☐ Well designed

☐ Further comments:

Annex 3.										
Adequacy for research										
Criteria	Policy maker's opinion				Final beneficiaries' opinion					
	Absolutely disagree	Disagree	Partially agree	Agree	Absolutely agree	Absolutely disagree	Disagree	Partially agree	Agree	Absolutely agree
I. Relevance										
1.To what extent the policy is consistent with the needs and priorities of the Vietnam's priorities?										
Yes				100%					35%	65%
No										
If yes then please specify how										
1.To what extent the policy is consistent with the needs and priorities of the final beneficiaries?										
Yes			15%	85%					100%	
No										
If yes then please specify how										
2.Are the groups of beneficiaries with the incentives instrument of policy?										
State-owned companies				100%				40%		60%
FDI companies				100%						100%
Other										
3. To what extent the current change fits into the needs and priorities of the final beneficiaries and Vietnam's priorities?										
Well-designed					57%					

Very helpful and supportive				25%
Not overly bureaucratic	23%			42%
Poorly designed	20%			33%
II. Efficiency				
<i>2.1. For policy makers</i>				
1. Is the policy design conducive to efficient achievement of the purpose and objectives of it?				
Well-designed				
Very helpful and supportive				
Not overly bureaucratic				
Poorly designed	100%			
2. Has the policy been managed and implemented in an efficient manner?				
Yes				
No	30%	70%		
If yes then please specify how				
<i>2.2. For enterprises</i>				
1. Did the policy identify clearly the critical implementation steps?				
Well-designed				
Very helpful and supportive				
Not overly bureaucratic				
Poorly designed				100%
2. What inputs and resources were required to implement the policy? Were all of these inputs and resources available?				
High skill experts or engineers	60%	25%	15%	

Technical facilities machinery and equipment	27%	18%	55%
Technology rights (patent, knowhow,...)			NA
Internal and/or external fund			NA
Further comments			
3. Has the policy been implemented in cheaper or quickly or easier way?			
Well-designed			
Very helpful and supportive			
Not overly bureaucratic			
Poorly designed			100%
4. What are the most important facilitates of and barriers to implementation this policy?			
Clear R&D definition for tax purpose	26%	35%	49%
Efficiencies and consistencies within current legal document			100%
Sufficient tax liability	60%	10%	30%
Clearance and transparent administration procedure		70%	30%
Predictability of tax support	100%		
Deficiencies and inconsistencies within current legal document		80%	20%
Further comments			
III. Effectiveness			
<i>3.1. For policy makers</i>			

1. Has the policy achieved its objectives (ex: boost the investment of business R&D)?				
Yes	60%	40%		
No				
If yes then please specify how				
2. What key outcomes were completed during implementing policy?				
High skill experts or engineers			100%	30% 70%
Technical facilities machinery and equipment	15%	45%	40%	100%
Technology rights (patent, knowhow,...)			NA	NA
Increasing turnover		30%	70%	100%
Further comments				
<i>3.2. For enterprises</i>				
1. How knowledge is effectively created, commercialized, and diffused?				
Very useful				30%
Limited				40%
Not available				30%
Further comments				
2. How technology transferred is taken?				
Widely available				40%
Limited				60%
Not available				
Further comments				

3. How do enterprises boost their investment for R&D?			
Yes	35%	20%	
No	45%		
If yes then please specify how			
4. How the policy is to reduce the marginal cost of R&D?			
Yes		30%	
No	70%		
If yes then please specify how			
5. What external factors influenced the implementation?			
Closed collaboration between university/ institution		60%	
Other funds		40%	
Further comments			
IV. Impact			
1. To what extent the policy influence on the R&D investment and social welfare?			
Yes	35%	55%	NA
No		10%	
If yes then please specify how			
2. How well has the policy succeeded to make progress towards achieving the overall objectives (ex: increase turnover, create new jobs)?			
Yes		55%	25%
No		20%	

If yes then please specify how		
V. Sustainability		
1. What are the possible strengths, weaknesses, opportunities or threats that enhance or inhibit the implementation and achievement of the policy's objectives?		
Yes	82%	75%
No	18%	25%
If yes then please specify how		
2. The changes of policy will be implemented.		
Quick/ Informative/ Not overly bureaucratic	55%	60%
Well designed	37%	35%
Further comments		

Annex 4

List of companies established STDF

Number	Company name	Address	Amount of STDF (million)	Questionnaires survey	Workshop
1	Vietnam Plastic Co., LTD	Ho Chi Minh	230	x	
2	Sacombank	Ho Chi Minh	100.000	x	
3	Tam Duc Hospital	Ho Chi Minh	1.250	x	
4	Quatest 3	Ho Chi Minh	6.650	x	
5	Le Phan Co., Ltd	Ho Chi Minh	19.174	x	
6	Lien Thanh Corp	Ho Chi Minh	8.130	x	
7	Tan Cuong Thanh	Ho Chi Minh	10	x	
8	Centre of Analytic	Ho Chi Minh	6.966	x	
9	Tien Phong Copr.	Ho Chi Minh	47	x	
10	Toan Cau Copr.	Ho Chi Minh	2.892	x	
11	Thach Anh Copr.	Ho Chi Minh	350	x	
12	Sieu Tinh Copr.	Ho Chi Minh	590	x	
13	Tan Tien Copr.	Ho Chi Minh	410	x	
14	Pharmacin 12	Ho Chi Minh	1.200	x	
15	PVFC	Ho Chi Minh	150.396	x	
16	Nagecco	Ho Chi Minh	1.930	x	
17	Thinh Phat	Ho Chi Minh	15.295	x	
18	Mechanical rubber Copr.	Ho Chi Minh	1.534	x	
19	Sai gon Trading Group	Ho Chi Minh	10.729	x	
20	Vietnam Rubber Group	Ho Chi Minh	387	x	
21	FAHASA	Ho Chi Minh	1.600	x	
22	ANA	Ho Chi Minh	17	x	
23	Sai gon Water supply group	Ho Chi Minh	3.595	x	
24	Gia Dinh Textile	Ho Chi Minh	690	x	

25	Packaging Printing Industry Group	Ho Chi Minh	8.357	x	
26	Public Service Co., Ltd Distric 7	Ho Chi Minh	450	x	
27	Sai gon Park	Ho Chi Minh	68	x	
28	The He Consultancy	Ho Chi Minh	93	x	
29	Ben Nghe Port Co., Ltd	Ho Chi Minh	4.690	x	
30	Sai gon Tourist Group	Ho Chi Minh	10.000	x	
31	Public Service Co., Ltd Distric 8	Ho Chi Minh	1.613	x	
32	Mien Tay Bus station Copr.	Ho Chi Minh	200	x	
33	Public Service Co., Ltd Distric 1	Ho Chi Minh	240	x	
34	Urban Drainage Co.	Ho Chi Minh	700	x	
35	Viettel	Ha Noi	2.500.000	x	x
36	PVN	Ha Noi	2.000.000	x	x
37	VNPT	Ha Noi	NA	x	x
38	PVEP	Ha Noi	NA	x	x
39	FPT	Ha Noi	NA	x	x
40	VVMI	Ha Noi	NA	x	x
41	ELCOM Corp	Ha Noi	NA	x	x
42	DIANA Corp	Ha Noi	NA	x	x
43	ADCC	Ha Noi	NA	x	x
44	Viet nam Construction Consultant	Ha Noi	NA	x	x
45	LOD	Ha Noi	NA	x	x
46	Ha Noi Drainage Co.	Ha Noi	NA	x	x
47	URENCO Ha Noi	Ha Noi	NA	x	x
48	AMEC	Ha Noi	NA	x	x
49	Construction Transportation 240 Co.	Ha Noi	NA	x	x
50	SDCC	Ha Noi	NA	x	x
51	Chemical Industry Co.,.	Ha Noi	1.800	x	x
52	Vietnam Pharmacy	Ha Noi	NA	x	x
53	EVERPIA	Ha Noi	14.400	x	x

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